An updated commentary on phyletic classification of the amphipod Crustacea and its applicability to the North American fauna.

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ABSTRACT

Bousfield & Shih (1994, Amphipacifica 1(3):76-134) provided a phyletic classification of the Amphipoda consistent with superfamily-level standards of classification in use for the Hyperiidea, Caprellidea, Ingolfiellidea, and Gammaridea. For gammaridean amphipods, the basis for phyletic classification is reproductive form and behaviour. Detailed character-state analyses support the view that the ancestral amphipod was a "swimmer-clinger", rather than a benthic "crawler-burrower". This study comments on difficulties posed to morphological classification by near-universal occurrence of homoplasy within major character states. Thepresent phyletic classification is here applied to a list of ~1650 scientific names of amphipod crustaceans from marine, freshwater and terrestrial habitats of North America (north of Mexico), updated to the end of the 20th century. Character state variation of antennal callynophore, brush setae, calceoli, uropods, and telson, and sexual dimorphism of gnathopods are further analysed. Suborders and gammaridean superfamilies are phyletically classified and annotated in tabular form. Although phyletic classification is presently controversial, alternative or more suitable phyletic groupings proposed by cladistic and/or rDNA analyses are yet lacking or unproven. Broad acceptance and/or usage of gammaridean superfamilies (or equivalents) outlined here provide demonstrably greater meaning and functionality to taxonomic interrelationships, and therefore greater research credibility than simple alphabetical listings of families and genera.

INTRODUCTION

Classification is the naming of essentially discreet groups of living organisms in a manner that reflects their probably correct phylogenetic history. Development of a classification requires input by scientists who are knowledgeable in animal systematics, and experienced in recognition of the significance of morphological characters and the probably correct ordering of the character states within the group concerned. Ideally, classification discriminates true phyletic relationships from homoplasious (artifical, convergent) similarities. Phyletic classification is thus distinct from, and far more useful than, an alphabetical listing of previously described taxa.

If the Darwinian theory of evolution is essentially correct for multi-cellular organisms, it follows that amphipod crustaceans evolved in only one manner, and left only one biohistorical "track record". As a corollary to that thesis, all species were at one time or another linked by so-called "intermediate" forms which, especially if extant, tend to mask the "clean" separation of lineages into pragmatically distinct clades or higher taxonomic groupings. For several reasons, however, phylogenists are unlikely to discover that record precisely. These factors include: (1) lack of a significant (long-term) amphipod fossil record (not earlier than Cenozoic); (2) incomplete description of extant taxa, especially of species from hypogean waters and the deep sea; and (3) a relatively undeveloped state of broadly applicable phyletic analysis. Clues to natural relationships are provided mainly by analysis of external and internal morphology, behaviour, physiology, and distributional ecology of extant species.

Methods of phyletic analysis, whether intrinsic, phenetic, cladistic, genetic, or in combination, require careful research input. Particlarly in treatment of speciose higher-level taxa, methodologies to date have proven neither "infallible", nor "guaranteed" to provide a realistic, credible result. Thus, in cladistic analysis, prior choice of ingroup/outgroup taxa, selection of numbers and kinds of morphological characters, and ordering of character states, all constitute subjective (and fallible) decisions that directly effect the quality of the results. Thus, sheer numbers of characters and character states, if inappropriately selected and/or wrongly ordered, may produce results that are actually misleading, internally conflicting, or otherwise of low credibility, particularly when compared with results employing other methodologies. Nor can a correct result be assumed because of the "sophistication" of methodology or computerized format.

The main text of this paper was first presented at the 10th International Colloquium on Amphipoda held at Heraklion, Crete, April 16-21, 2000. The purpose of the work is to review the status of phyletic classification of the Amphipoda, and demonstrate its applicability to a recently compiled list of amphipod families, genera, and species recorded to date from the North American continent north of Mexico.

ACKNOWLEDGMENTS

The author is grateful to many colleagues for their stimulating taxonomic and phyletic input, especially Dr. Michael J. Thurston (deep-water taxa), Dr. Jorgen Berge (stegocephalid reclassification), Dr. J. Emmett Duffy (genetic methodologies), Dr. C.-t. Shih (hyperiid classification), and Dr. J. K. Lowry (lysianassoid and podocerid phyogeny).

Compilation of the list of North American amphipods (Appendix I) involved the services of many colleagues, co-ordinated through a Committee on Scientific and Common Names of Invertebrate Animals (CNIA), chaired by Dr. Donna D. Turgeon, NOAA, Washington, DC. A full list of contributors is to be included in a final CNIA report and publication. Especially helpful to the author, who served as amphipod subcommittee chairperson and project co-ordinator, have the been the following amphipod systematists: Dr. Pierre Brunel, Université de Montréal, (Atlantic gammarideans); Dr. Donald B. Cadien, Marine Biology Lab, Carson, CA (SW Pacific gammarideans); Dr. Kathleen E. Conlan and E. A. Hendrycks, Canadian Museum of Nature, Ottawa, ON (Arctic and Pacific gammarideans); Dr. John Foster, Panama City, FL (Hyperiidea, Gulf of Mexico); Stephen Grabe, Environmental Protection Commission, Tampa, FL (Gammaridea, Ingolfiellidea: Gulf of Mexico); Dr. John R. Holsinger, Old Dominion University, Norfolk, VA (freshwater amphipods); Diana R. Laubitz, Canadian Museum of Nature, Ottawa, ON (Caprellidea); Sara E. LeCroy, Gulf Coast Research Laboratory, Ocean Springs, MI (Gammaridea: Gulf of Mexico); Dr. Chiang-tai Shih, Fisheries Research Institue, Taiwan (Hyperiidea); and Dr. Craig P. Staude, Friday Harbor Laboratories, WA (Pacific Gammaridea).

CLASSIFICATORY SYSTEMATICS.

The malacostracan order Amphipoda has long been considered an especially difficult problem of phyletic classification (Riley 1983; Schram 1986). The problem of internal classification of this ordinal crustacean group is complicated by extreme diversity of body form ranging from thick-bodied spiny-legged burrowing haustoriids; big-eyed fast-swimming oceanic hyperiids; slender-bodied skeleton shrimps, to eyeless, vermiform infaunal ingolfiellids. How might we find commonality of relationships among widely diverse external pigmentation, from the pure white of burrowing phoxocephaloideans, through beautifully cryptic maculation of "swash-zone" pontogeneiids and calliopiids, to the vertical striping of odiids and multivariate pigmentation of "thick nosed" pleustids and minute commensal stenothoids? What natural ordering, if any, might exist between such diverse feeding types as free-swimming predaceous eusiroideans and pardaliscodeans, longicorniculate trypton-feeding podocerids, and vertically tube-building ampeliscids? Phyletic classification seeks to provide answers to these questions and bring a semblance of natural order out of almost chaotic diversity of form and behaviour.

The history of development of amphipod classificatory systems has been outlined by Bousfield and Shih (1994) and is briefly summarized here. In essence, during a period of taxonomic discovery lasting approximately two centuries since the time of Linneus (1758), phyletic (superfamily-level) classifications finally came into standard use for the Hyperiidea through the work of Bowman & Grüner (1973), for Ingolfiellidea by Stock (1977), and for Caprellidea notably by Vassilenko (1974) and D. R. Laubitz (1993).

Within the diverse and taxonomically more difficult suborder Gammaridea, however, the story is more complex. For nearly two centuries (to the mid-1950's) gammaridean classification had been essentially phyletic, stabilized by the semi-phyletic, non-alphabetical arrangements of families proposed by Sars (1895) and Stebbing (1906). This system was broadly accepted and utilized by amphipod systematists at least until the early fifties (e.g., Shoemaker 1930; Gurjanova 1951; Dunbar 1954). However, two major weaknesses in these classifications remained: (1) several large families such as "Gammaridae" and "Lysianassidae" were weakly defined, effectively polyphyletic, or otherwise "unwieldy", and (2) other, mostly smaller families "begged" for inclusion within higher "umbrella" categories that would recognize their close phyletic similarities. In the second instance, Bulycheva (1957) proposed the super-family name Talitroidea to encompass the naturally related families Hyalidae, Hyalellidae, and Talitridae. J. L. Barnard (1973) combined a number of domicolous families within superfamily Corophioidea. In the first instance, the formal task if unravelling family-level units within polyphyletic family "Gammaridae" was initiated mainly by Bousfield (1973, 1977). Recombination within superfamily categories, of several older family names and those newly proposed, soon culminated in a fully phyletic classification of suborder Gammaridea (Bousfield 1979, 1982a, 1983). This classification was adopted to various degrees by Riley (1983), Schram (1986), and Ishimaru (1994). Some superfamily concepts were also revised and expanded by others [e.g., Crangonyctoidea by Holsinger 1992a; Lysianassoidea by Lowry and Stoddart 1997). As updated by Bousfield and Shih (1994), the "new" phyletic classification proved basically not unlike the semi-phyletic family "arrangement" of Sars (1895) and Stebbing (1906), since both recent and older systems were presumably based on similar conceptual ordering of character states of reproductive morphology and behaviour.

In the interim, however, J. L. Barnard had become dissatisfied with perceived anomalies of the Sars-Stebbing classification and the apparent intractability of their ready solution. Although he informally diagrammed suggested relationships between known amphipod families, based on a "*Gammarus*-like" prototype, he commenced listing gammaridean families and genera in alphabetical sequence (1958, 1969). The pragmatics of a simple alphabetical treatment of higher gammaridean taxa, then approaching 100 family names, was soon widely adopted. In further updatings and expansions of these original compendia (Barnard & Barnard 1983; Barnard & Karaman 1991), a number of anglicized concepts of some higher groups were proposed. These included the names "gammaridans", "hadzioids", etc., and later (Williams & Barnard 1988) "crangonyctoids", as well as a broadening of some original formal family-level concepts (e.g., Eusiridae, Corophiidae). Notably perhaps, these names corresponded, with about 75% similarity, to superfamily concepts formally proposed earlier in the phyletic literature. However, with Gordan Karaman (1991, p. 7), Barnard steered away from formal phyletic classification and concluded this final major work with an alphabetical listing of all families and component genera.

During the past two decades, some major regional faunistic studies have utilized mainly alphabetical listings and retained older treatments of higher taxa such as "Gammaridae" (e.g., Ruffo et al 1982, 1988, 1993, 1998; Camp (1998). However, with increasing sophistication of cladistic analytical methodology (e.g., Lowry & Myers, in prep.), earlier superfamily concepts are now being re-analysed [e.g., Serejo 2000 in press (Talitroidea); Berge and Vader 2000, in press (Stegocephaloidea)], and new superfamily taxa proposed (e.g., Iphimedioidea Lowry & Myers, 2000). In the light of recently proposed phyletic studies utilizing genetic methodology (e.g., Shram, 2000; Macdonald 1999), a resumption of development of phyletic classification of the gammaridean Amphipoda now seems promising.

Character State Analyses

As noted above, the present analysis of phyletic classification within the order Amphipoda is based mainly on reproductive morphology and behaviour, updated from earlier work (Bousfield & Shih, 1994). To some degree, modified repetition of material here compensates for the limited original circulation of that source paper, now out of print. The present analysis, however, utilizes only seven mostly reproductively significant, characters and character states. These include sensory organelles of the antennae (callynophore, brush setae, and calceoli); form of the telson, and degree of sexual dimorphism and use of the gnathopods during amplexus. To these has been newly added the form of the rami of uropods 1 & 2. The character states vary widely and homoplasiously from group to group, as do those of the mouthparts, coxal plates, peraeopods, and uropod 3 of the earlier study. Nonetheless, collectively and judiciously, they provide a consistent and verifiable morphological basis for phyletic grouping of higher amphipod taxa.

In general, the ordering of character states is based on an assumed plesiomorphic condition in more primitive "outgroup" members of the superorder Peracarida, such as the Mysidacea and Cumacea, and more primitive members (shrimp-like groups) within the Decapoda. Thus, in members of phyletically primitive amphipod groups ("swimmers"), the sensory organelles of the antennae are well developed, the telson is typically bilobate, and sexual dimorphism of the gnathopods is rare or lacking. Since the mating process usually takes place in the open water column, precopulatory "holding" of the female by the male gnathopods is apparently not developed. Conversely, in members of phyletically more advanced gammaridean superfamilies ("crawlers"), the antennal sensory features are much reduced or lacking and the telson lobes are often fused apically. Since mating usually occurs on (or in) the bottom substrata, often in strongly lotic waters, the male gnathopods are typically strongly modified for pre-amplectic grasping and holding of the female and/or agonistic behaviour with other males.

The Antennal Callynophore

The callynophore consists of a bundle of close-set aesthetases on the postero-medial margin of the fused (or conjoint) basal segments of the flagellum. This organelle occurs typically within pelagic ordinal groups of the higher Malacostraca and, within the Amphipoda, characterizes superfamily groups of the "Natantia", especially the Hyperiidea (Fig. 1d). Its primary func-

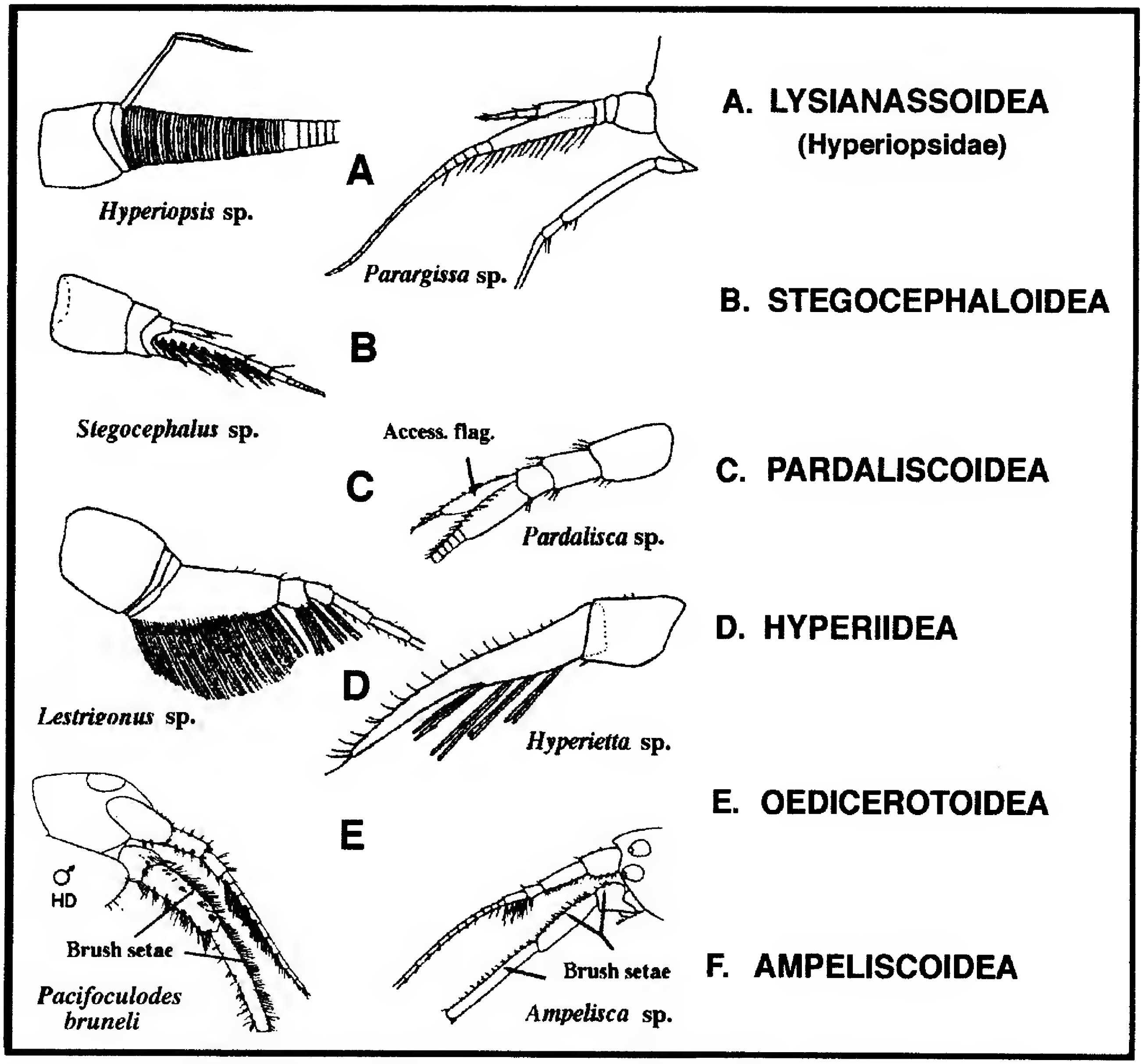

Fig. 1. Types of antennal callynophores [after Barnard (1969), Bowman & Grüner(1973), Bousfield & Chevrier (1996), and unattributed sources].

tion is almost certainly chemosensory. Its presence mainly in the final adult male instar would seem to be of direct reproductive significance in the detection of females within the water column. However, in some lysianassoidean and synopioidean subgroups, callynophore-like structures may also be present in mature females and subadult stages, perhaps indicating a possible secondary role in detection of food resourees.

Representative forms of callynophores within the Amphipoda are illustrated in Fig. 1. Lowry (1986) has described a one-field arrangement of the callynophore within families Platyischnopidae, Urothoidae and Phoxocephalidae (Phoxocephaloidea), a condition he considers primitive, and in some hyperiids (e.g., Archaeoscinidae), perhaps convergently. In all other taxa the arrangment is two-field.

The possible significance of the callynophore in phyletic classification was first introduced by Lincoln and Lowry (1984) and amplified formally by Lowry (1986). Although strongly developed in pelagic carnivores and necrophages, especially where calceoli are weak or lacking (e.g., Synopioidea, Pardaliscoidea, Stegocephaloidea, and Hyperiidea), the organelle is generally weak or lacking in reproductively pelagic but vegetatively benthic groups such as the nestling Dexaminoidea and tube-building Ampeliscoidea, and in the fossorial Phoxocephaloidea and Pontoporeioidea. It is virtually lacking in several "natant" subgroups where the entire life cycle is essentially infaunal (e.g., Haustoriidae), or commensal or parasitic (e.g., some Lysianassoidea) and/or where preamplexing reproductive behaviour has secondarily and convergently developed (e.g.,Paracalliopiidae and Exoedicerotidae within Oedicerotoidea). Curiously, the callynophore is surprisingly weakly developed in the mainly marine but mainly acalceolate family Oedicerotidae and even within the Eusiroidea (e.g., in the pelagic, primitive family Eusiridae, but not found in Pontogeneiidae, nor Calliopiidae).

The callynophore is essentially lacking in reproductively benthic Reptantia, including the Caprellidea and Ingolfiellidea, and not found in freshwater taxa, even in those that have apparently become secondarily pelagic such as *Macrohectopus* within the Gammaroidea. However, callynophore-like structures have been reported from a few Amphilochidae (e.g. *Austropheonoides, Peltocoxa*) and Cressidae (*Cressa cristata*) within primitive subgroups of superfamily Leucothoidea (Lowry 1986).

The presence or absence of a callynophore may therefore offer a useful criterion of reproductive life style. Although its occurrence appears subject to homoplasious tendencies, such aberrancies may be correlated with non-reproductive features of life style and are thus predictable. In broader perspective, the presence of a callynophore is a plesiomorphic, or basic feature of malacostracan reproductive morphology. As concluded previously (Bousfield & Shih 1994), the callynophore provides a primary basis for development of a phyletic classification within the Amphipoda.

Antennal Brush setae

The term "brush setae" applies to dense tufts or clusters of short brush-like setae that variously line the anterior margins of peduncular segments 3, 4, and 5 of antenna 2. Brush setae may occur also on the posterior (lower) margins of peduncular segments 1-3 of antenna 1 (e.g., in Dexaminoidea). Similar types of setae occur in other peracaridan taxa, including the Cumacea and Mysidacea.

Within the Amphipoda these organelles have been found only in the terminal male stage of pelagically reproductive amphipod superfamilies, and not in subadult males, females, and/or immature stages. Their function is yet unknown and conjectural. Although brush setae may not have been studied in ultrastructural detail, their gross morphology is similar to modified setae rather than thin-walled aesthetascs. Their role may be tactile when, during the process of copulation, the male is briefly in close contact with the female.

The potential usefulness of brush setae in phyletic classification was previously suggested by Bousfield (1979); Bousfield & Shih (1994). These organelles are most strongly developed in non-calceolate primitive superfamilies of Natantia (e.g., Pardaliscoidea, Synopioidea), and moderately developed in some calceolate "natant" taxa (e.g., Lysianassoidea, Phoxocephaloidea, Eusiroidea, Oedicerotoidea), and acalceolate "transitional" super-families (e.g., Dexaminoidea, Ampeliscoidea, and Mel-phidippoidea). They are less well developed or rare within the Stegocephaloidea and Hyperiidea (Fig. 1).

The presence of brush setae in males only indicates that their function is reproductively significant. Their limited distribution within the Natantia and total absence from the Reptantia indicates a potentially primary value in phyletic classification.

The Antennal Calceolus

The calceolus is a slipper-shaped membranous microstructure attached variously to the anteromedial segmental margins of the flagella and peduncles of both antenna 1 (antennule) and antenna 2 of some gammaridean Amphipoda. Principal features of these micro-structures have been described, across a broad range of higher taxa, by Lincoln and Hurley (1981) and, with special reference to genera within the primitive "reptant" superfamilies Crangonyctoidea and Gammaroidea, by Godfrey et al (1988). The calceolus is not to be confused with the aesthetasc, a sublinear thin-walled microstructure of mainly chemosensory function, found only on flagellar segments of antenna I in most species of Amphipoda. The aesthetasc also occurs widely across malacostracan ordinal subgroups, including the Decapoda. The calceolus is also structurally readily distinguishable from brush setae and other seta-like structures co-occurring on antennal peduncular and flagellar segments.

Representative types of amphipod calceoli are illustrated in figs. 2 & 3. Calceolus-like structures are found on the proximal flagellar segments of antenna 1 (male) of a few other malacostracans, notably within the Syncarida (e.g., *Koonunga cursor*) and the Mysidacea (e.g., *Xenacanthomysis pseudomacropsis*). Such structures are not considered calceoli by Lincoln (pers. commun.) since they may be convergent in form and/or of different function. However, these organelles are included here as of possible phyletic significance within the Malacostraca and, in my view, merit further comparative micro-anatomical and behavioural study.

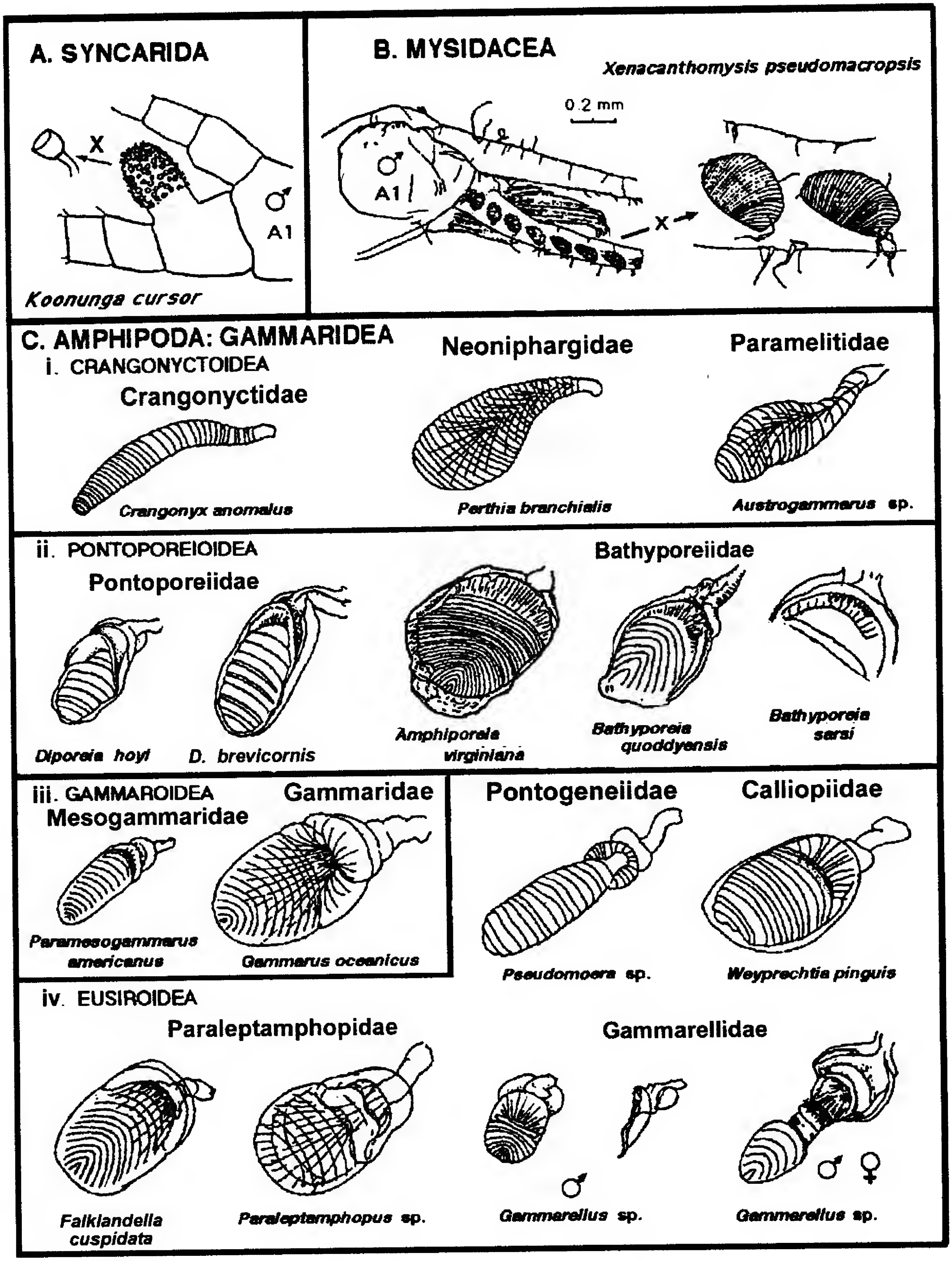

Fig. 2. Types of antennal calceoli in gammaridean Amphipoda, and positionally similar organelles in other malacostracan Crustacea (modified from Bousfield & Shih 1994).

The presumed "advanced" form of the calceolus is grossly similar to that of a parabolic radar "dish" (Fig. 2C,D). Combined with its anterior antennal location, this morphology suggests that the organelle functions primarily as a mechanoreceptor for aquatic acoustical vibrations. However, its innervation and connection to the brain has not yet been ascertained, nor have micro-acoustical studies yet confirmed its true function (Lincoln & Hurley 1981).

The distribution of calceoli between the sexes suggests that calceoli developed initially in males only, presumably as a device for detection of vibrations from swimming females of its own species. In free-swimming raptors (e.g., Gammarellidae within the Eusiroidea), special types of calceoli have apparently developed in females and immatures, and occur alongside the reproductively functional form of calceolus in terminal stage males. As described by Steele & Steele (1993), these organelles appear to have became more complex structurally, presumably, and possibly secondarily adapted, for detection of escape vibrations of free-swimming prey. However, the primary reproductive function of calceoli apparently diminished or disappeared in concert with changes in life style from pelagic to benthic, neritic to abyssal, lotic to lentic, marine to freshwater, epigean to hypogean, and corresponding development of pre-amplexing gnathopods (see p. 61). As indicated in Fig. 3, reduction and disappearance of calceoli occurred initially in antenna 1 and subsequently in antenna 2. Within the latter, the sequence of loss was initially from the peduncle and distal flagellar segments, and finally from the proximal flagellar segments. However, as noted above, calceoli persisted in both males and females of some epigean freshwater groups (e.g., some Gammaridae, Anisogammaridae) and/or cave pool amphipods where life styles presumably remained free-swimming and raptorial (e.g., *Crangonyx packardi* and *Sternophysinx calceola* (Crangonyctoidea); *Sensonator valentiensis* (Melphidippoidea?), and several eusiroideans of southern continental land masses (Bousfield 1980).

The possible significance of antennal calceoli in phyletic classification of the Amphipoda has been alluded to variously by Bousfield (1979, 1983), Lincoln and Hurley (1981), Lincoln & Lowry (1984), and more recently by Godfrey et al. (1988), Stapleton et al (1988), Holsinger (1992a), and Steele & Steele (1993). These views were analysed and expanded upon by Bousfield & Shih (1994) and are here summarized and updated, with special application to the North American amphipod fauna (Appendix I).

The external morphology of the calceolus within the primitive reptant superfamily Crangonyctoidea (category 9, Lincoln and Hurley 1981) appears to be the most simplified, and thus probably the most plesiomorphic extant form (Figs. 2 A & 3). It consists only of a basal stalk and elongate body that bears numerous (20+) elements of similar simple structure. Holsinger (1992a) has distinguished two subcategories of calceoli within the Crangonyctoidea. In members of holarctic family Crangonyctidae (*Crangonyx, Synurella*, pp. 101-104) the form is slender and elongate, with a simple branched internal "tree trunk" configuration. Some separation of basal elements in *Crangonyx richmondensis*, illustrated by Godfrey et al. (1988), are suggestive of "protoreceptacles". By contrast, the calceolus within austral families Sternophysingidae and Paramelitidae is typically broad, paddle-shaped, and its internal tree-trunk configuration has more numerous indistinct branches, a seemingly more plesiomorphic condition. In slightly more advanced types of calceoli (Fig. 3,upper: Phoxocephaloidea), the elements are fewer (10-15 in Platyischnopidae; 4-6 in Phoxocephalidae) and the body may be short and spatulate, or barrel-shaped.

With respect to the sexes, the more plesiomorphic types of calceoli occur (with very few exceptions) in the 'males only' category of presumed most primitive superfamily taxa such as the Crangonyctoidea, Phoxocephaloidea, Pontoporeioidea, and most of the Lysianassoidea (Fig. 2, i, ii; Fig. 3, upper two rows).

In more advanced types of calceoli (Fig. 2, iii), the basal element is broadened and forms a receptacle that is weakly developed in Pontoporeioidea and Gammaroidea but strongly so in Eusiroidea (Fig. 2, iv). The basal stalk is distally expanded into a bulla or resonator, weakly and more strongly in those same groups respectively. In some Pontoporeioidea (Bathyporeiidae), finger-like processes protrude over the proximal elements. In the most advanced types of calceoli (viz., in some Eusiroidea: Gammarellidae, Eusiridae), and in some pelagic Lysianassoidea (e.g., *Ichnopus* spp., Lowry and Stoddart 1992), the distal elements are few and widely separated from one or more large, cup-shaped receptacles, and the bulla may be prominent.

The evolutionary morphological sequence within calceoli portrayed here is believed to match more closely the phylogeny of corresponding superfamily groups, based on other character states (see below), than does the somewhat pragmatic sequence originally provided by Lincoln and Hurley (1981).

A graphical plot of the types of calceoli and their

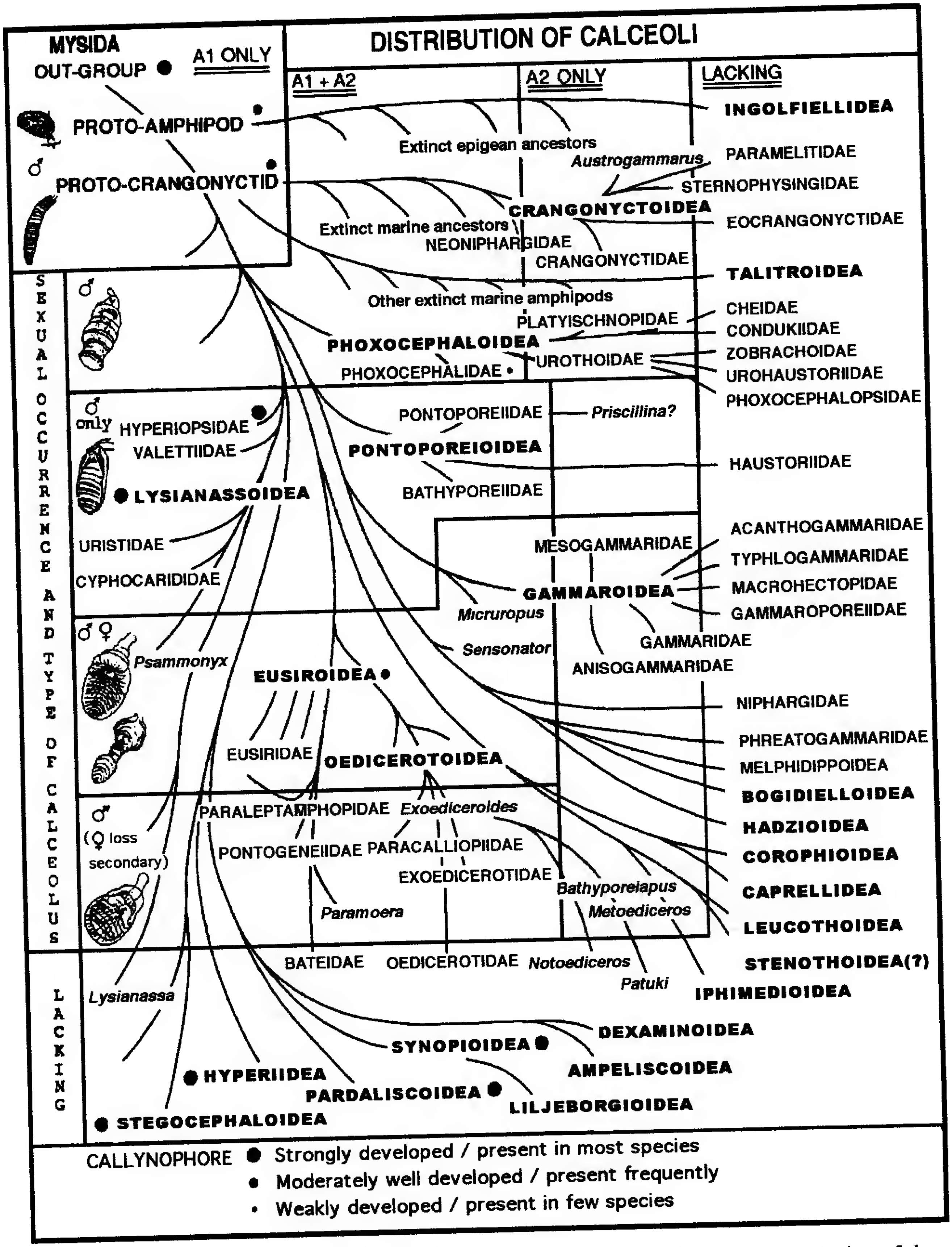

Fig. 3. Suggested phylogenetic relationships within the Amphipoda based on distribution of the calceoli on the antenna and between the sexes (modified from Bousfield & Shih 1994).

distribution by antennal site, sex, and higher taxon, can be linked by means of a branching arrangement with relationships that, in part, are remarkably similar to phyletic arrangemcnts derived elsewhere from analysis of other character states (Fig. 3). In the first two categories, this arrangement goes somewhat beyond the relationships proposed by Lincoln & Lowry (1984) on the basis of the taxonomic (classificatory) distribution of calceoli. In the present chart, the positions of the major taxa in the various "boxes" are correlated primarily with the distribution (or lack) of calceoli on one or other (or both) antennae, along the horizontal axis and with the morphological type and its sexual occurrence, on the vertical axis. The vertical and horizontal axes also simulate, fanwise, an approximate evolutionary time scale for the probable frst appearance of the ancestral type of each major taxonomic group.

The arrangement of calceoli is here rooted in a presumed mysid-like out-group in which calceolus-like structures are known, at least on antenna 1 of the male. Such structures may have occurred in presumed former epigean and pelagic marine ancestors of the now hypogean relict suborder Ingolfiellidea, and of the continental freshwater-endemic Crangonyctoidea. Such epigean and marine ancestral types have not yet been found extant, or in the fossil record, but are predicted from this study and from earlier considerations (e.g., Bousfield 1982b). In this two-dimensional scheme, all members of the seven calceolate superfamilies, and the enigmatic hypogean calceolate *Sensonator valentiensis* Notenboom, 1986 (Melphidippoidea?), cannot be confined cleanly within any given graphical box. Such variance is attributable to parallel development, diversification, and subsequent loss of calceoli from the antenna of both sexes, presumably in response to changing life styles within the various taxonomic subgroups (above). Notably, the more strongly calceolate superfamily groups (calceoli on both A1 and A2, left column) are those in which members are primarily pelagic and/or reproduce freely in the water column. These include most Phoxocephaloidea, Pontoporeioidea, Lysianassoidea, Eusiroidea, and Oedicerotoidea. The less strongly calceolate superfamilies (with rare exceptions, calceoli on A2 only, right column) are found in the most primitive members of benthic superfamilies of the Reptantia (Crangonyctoidea, Gammaroidea). The position of acalceolate superfamilies is tentative, but is suggested partly by the presence or absence of other presumably plesiomorphic, often vestigial characters such as antennal callynophore and brush setae (above).

The presence or absence and type of antennal calceolus are character states of undoubted phyletic significance. However, their restricted distribution among extant gammaridean superfamilies limits their use to cases of phyletic classification where other parameters of broader classificatory applicability (e.g, form of uropods, coxal plates, gnathopods) are known.

Uropods 1 & 2.

The uropods of amphipods are biramous appendages of the three posterior abdominal segments. They function mainly in forward propulsion during swimming or crawling activities. The uropods are well developed and conspicuous in most gammarideans, hyperiideans, and ingolfiellideans, but minute or lacking in caprellideans. The rami are seldon equal in size, the outer usually being noticeably the shorter. Only within the Ingolfiellidea is uropod 2 typically larger than uropod 1.

Morphological variation in the rami of uropod 3 and its utilization in phyletic classification have been analyzed previously (Bousfield and Shih 1994). In this study, the form and armature of the rami of uropods 1 & 2 are similarly investigated. In nektonic forms, the rami are often lamellate or lanceolate, whereas in benthonic crawling or burrowing forms the rami are typically styliform (Schram 1986). The rami may also be modified for specialized functions in domicolous and/or commensal species, and for presumed copulation (in males) widely across the taxonomic spectrum (e. g., in some Lysianassoidea, Crangonyctoidea, Talitroidea, and Gammaroidea). At higher taxonomic levels, armature of the peduncle may also prove phyletically significant, particularly the development of baso-facial spine(s) in gammaroidean superfamilies, and distolateral spines in gammarioideans and some fossorial superfamilies (e.g., Phoxocephaloidea and Pontoporeioidea).

Figure 4 illustrates three main types of rami of uropods 1 & 2 and their occurrence in representative gammaridean superfamilies. Lanceolate rami (A) are generally slender and taper distally to an acute apex that lacks distinct apical spine(s) or spine clusters; marginal spines (when present) are typically arranged in opposing, evenly spaced series. Lanceolate rami typify the most primitive superfamilies of reproductive "swimmers" (Natantia), including the Lysianassoidea, Phoxocephaloidea, Pardaliscoidea and most Eusiroidea. Linear rami (C) are generally thick and robust (styliform), with subparallel margins that tapering only slightly distally; the apex is rounded or blunt, and usually bears a distinct cluster of spines of unequal length. These rami typify mostly benthonic crawling or burrowing superfamilies, with reproductively pre-

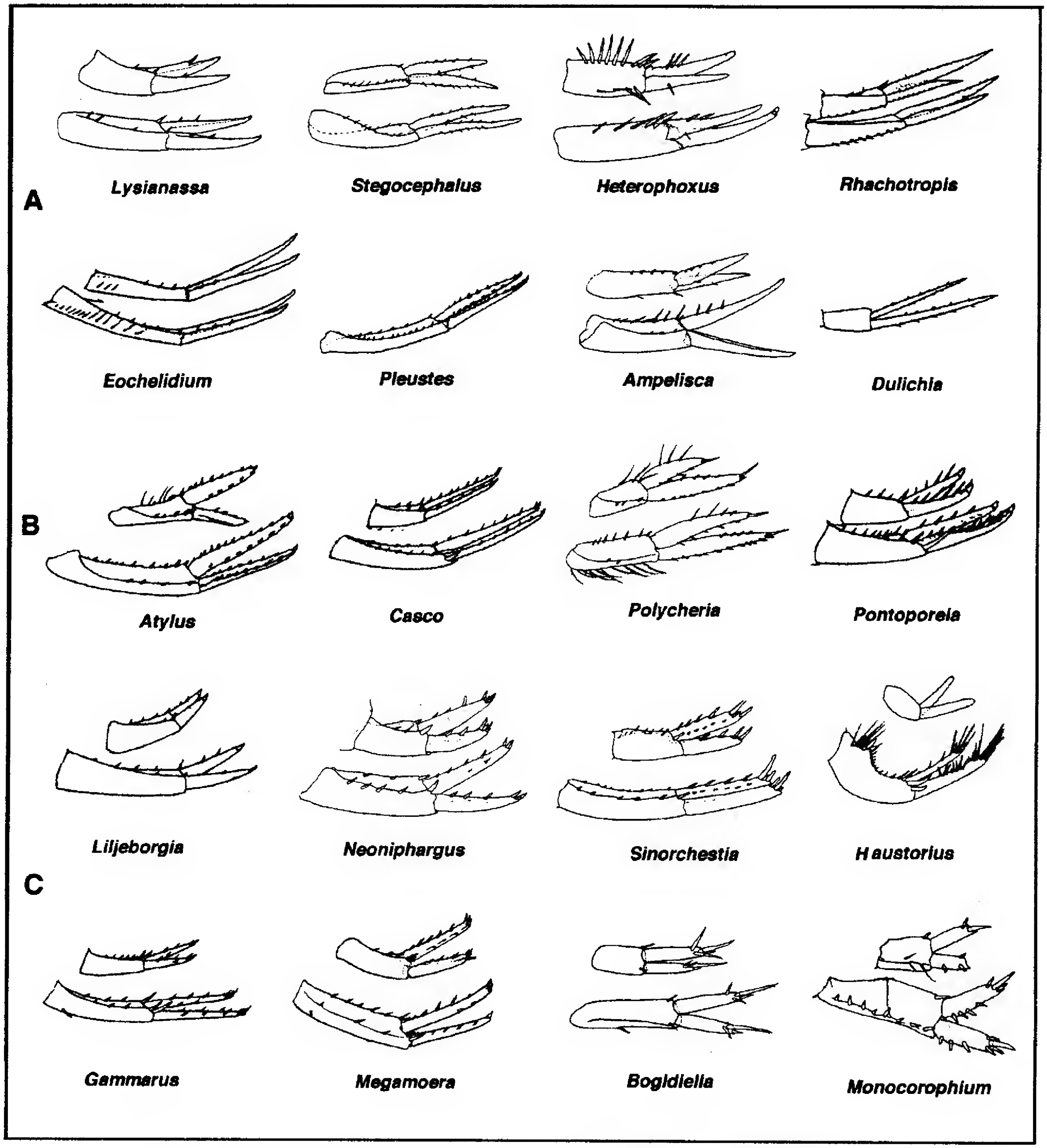

Fig. 4. Form of rami of uropods 1 & 2. A. Lanceolate; B. Transitional; C. Linear. (After Bousfield (1973) and unattributed sources)

amplexing gnathopods (Reptantia), such the Crangonyctoidea, Talitroidea, Gammaroidea, and Corophioidea. Transitional rami (B) taper variously to a subacute apex that may bear a single spine or a few very short spines; marginal spines are usually present and serially arranged (e. g., Dexaminoidea and Melphidippoidea).

The form and armature of the rami of uropods 1 & 2 apparently transcends these categories within a few gammaridean superfamilies (e.g., Pontoporeioidea). Also, within family Podoceridae, the dulichiid subgroup possesses lanceolate uropod rami that are atypical of superfamily Corophioidea, to the other character states of which the dulichiids conform reasonably well. The vestigial uropod rami of cercopid caprellidean amphipods are also lanceolate. Such a character state

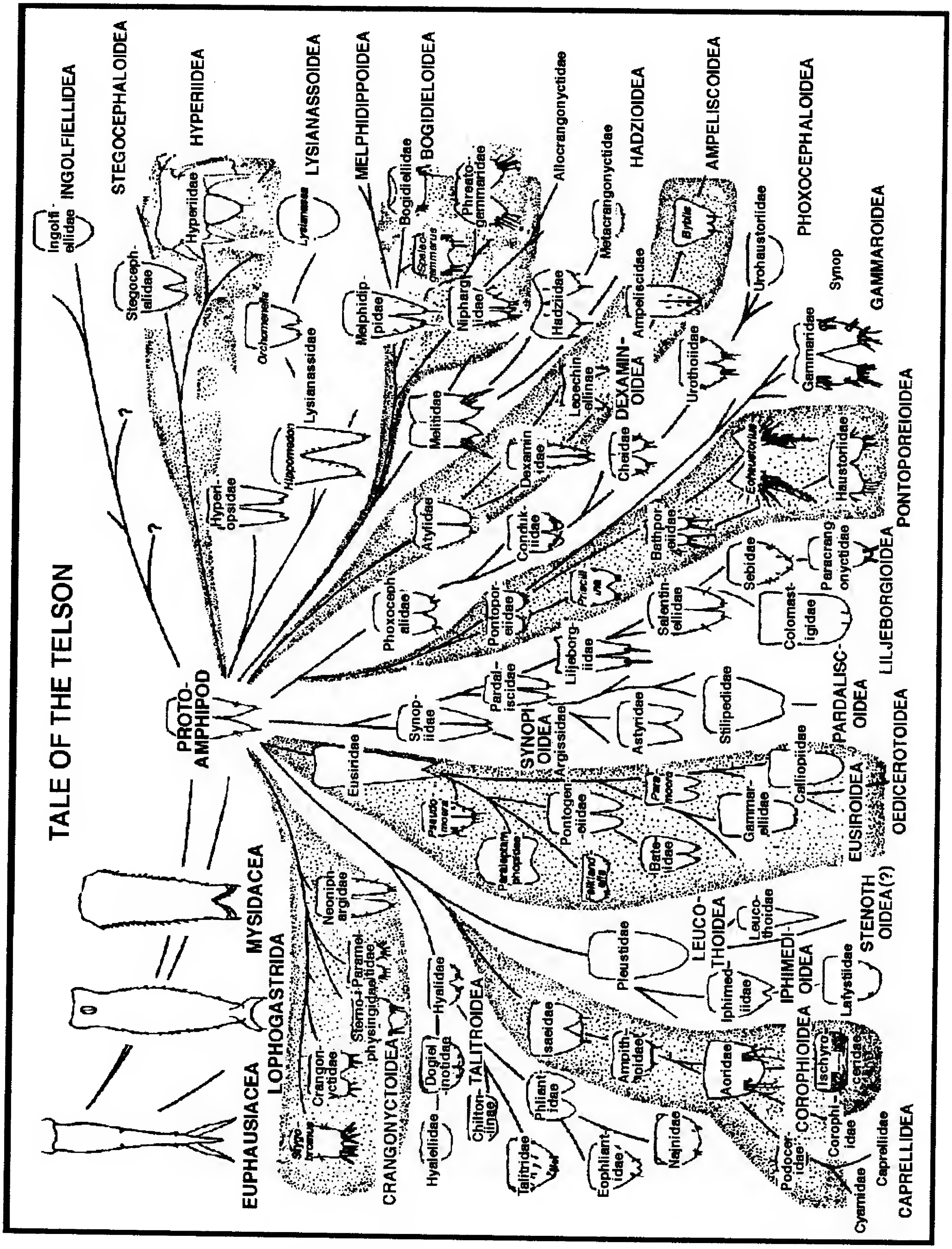

Fig. 5. Suggested evolutionary relationships of the telson within the Amphipoda. (modified from Bousfield & Shih 1994).

"anomaly" apparently supports direct phyletic ancestry of dulichiids to the cercopid line of Caprellidea, as proposed by Laubitz (1993). It may suggest a possible diphyletic origin of the Corophioidea, and consideration of a possible leucothoidean ancestry for the dulichiid podocerids (see fig. 7; Bousfield & Shih 1994).

However, broadly across families of most gammaridean superfamilies, the uropod ramal condition is remarkably stable and correlates well with the phyletic status of other character states in those same taxa. Thus, the lanceolate condition is typical of superfamilies that exhibit plesiomorphic states of antennal sensory organelles and sexually similar gnathopods. Conversely, the linear ramal condition is associated most frequently with apomorphic reduction of antennal sensory organelles, presence of sexually dimorphic gnathopods, and reproductive pre-amplexing behaviour. Not surprisingly, the transitional ramal form occurs mainly in higher taxa with a phyletically "intermediate" status of other character states. Thus, the form and armature of uropods 1 & 2 appear to be character states of high-level classificatory significance.

The Telson.

The form of the telson has long been considered a character of prime taxonomic significance (Stebbing 1906; Barnard & Karaman 1991). Its probable function in both free-swimming and benthonic life styles, and its overall significance in superfamily level classification has been reviewed by Bousfield & Shih (1994). The deeply bilobate form is generally deemed the plesiomorphic condition within amphipodan, peracaridan, and indeed, all malacostracan crustaceans (Schram 1986). Conversely, the entire, platelike, or "fleshy" form of the telson, presumably represents a distal fusion of the two primary lobes (e.g., as in superfamilies Leucothoidea and Corophioidea respectively) and thus the typical apomorphic state. A very advanced condition is seen in the Thaumatelsonidae and many Hyperiidea, where the plate-like telson is fused with the urosome. A less frequent but presumably apomorphic condition occurs where the lobes become separated throughout their entire length (as in most Gammaroidea and certain Hadzioidea) and attains an extreme separation dorsally on urosome 3 (abominal segment 6) in the advanced fossorial genus *Eohaustorius* (Pontoporeioidea).

A panoramic view of telson types across the spectrum of higher amphipod taxa is provided in Figure 5. The prototype amphipod is depicted with a bilobate telson, the apex of each lobe having a "notch and spine" configuration derived from a presumed pelagic peracaridan (primitive malacostracan) ancestral outgroup. Following evolutionary lines outwards from this base through each superfamily group, we find that member species and genera having the greatest number of plesiomorphic character states (those nearest the base) also tend to have a fully or partially bilobate telson. Conversely, member species and genera with the most apomorphic or derived character states, in balance, usually show the most strongly fused or plate-like form of the telson. The totally bilobate apomorphic form may be noted in advanced members of the Gammaroidea and in some members of the Pontoporeioidea (family Haustoriidae).

However, the overall form of the telson proves not directly significant in development of a phyletic classification. As noted in fig. 5, development of a plate-like telson takes place independently and homoplasiously within nearly every superfamily group. Derivation of a superfamily group based solely on a plate-like telson would encompass members of at least ten different major groups, and thus be totally artificial. However, within component families of the most primitive superfamilies of "Natantia" (e.g., Lysianassoidea, Phoxocephaloidea, Eusiroidea, Pardaliscoidea) the deeply bilobate form of the telson is dominant. Conversely, within the more advanced "natant" superfamilies such as the Oedicerotoidea and Leucothoidea, the Hyperiidea, and among most reptant superfamilies (e.g., Crangonyctoidea, Talitroidea, Bogidielloidea, Corophioidea), the distally notched or plate-like form is dominant.

Despite contrary views of some (e.g., Barnard & Karaman 1981, 1991), the balance of evidence strongly supports the overall conclusion that a deeply bilobate telson is the plesiomorphic or ancestral condition within the Amphipoda. Conversely, a plate-like or apically entire telson is the apomorphic or advanced condition. However, structure of the telson appears to be more dependent upon factors of life-style at lower taxonomic levels rather on the more broadly "stable" features of reproductive biology. Character states of the telson may therefore be phyletically significant only at family, subfamily, or even generic classificatory levels.

Phyletic Significance of Gnathopod Structure

The external morphological features of the gnathopods (peraeopods 1 & 2 of formal malacostracan terminology) have previously been considered one of the most significant and fundamental indicators of high level phyletic relationships within suborders Gammaridea (Stebbing 1906); Barnard & Karaman 1991) and Caprellidea (Laubitz 1993; Takeuchi 1993). A cross-section of amphipod gnathopod types was also analyzed by Bousfield & Shih 1994.

Early taxonomic studies had long detailed the sexually dimorphic, powerfully subchelate form of the gnathopods of intertidal and freshwater species of *Gammarus* of northwestern Europe. In females and immature stages, these anterior appendages were used mainly as implements of food-gathering but, in sexually mature males, are utilized in precopulatory carrying of the female, thus ensuring close proximity of the sexes at the time of her "mating" moult (ecdysis). Justified or not, *Gammarus* was considered by many workers to be the basic or ancestral amphipod reproductive form (e.g., Barnard 1969).

More recent studies (e.g., Borowksy 1984; Conlan 1991a) have investigated gnathopod morphology and sexual dimorphism across a broad spectrum of amphipod superfamilies. The results have been compared with a pre-amplexing and/or mate-guarding form of reproductive behaviour in species of *Gammarus* of northwestern Europe. As indicated by Schram (1986), this form of reproductive behaviour is now considered by most workers as relatively highly evolved and specialized within the Amphipoda.

The search for a probable ancestral form of the gnathopods first centred on members of superfamilies that were classified as primitive on the basis of other plesiomorphic character states. Over a range of family and generic morphotypes within the primitive superfamily Lysianassoidea (e.g., Barnard and Ingram 1990; Lowry & Stoddart 1997), the distal portions (carpus, propod and dactyl) of both gnathopods in both sexes, are found to be consistently subsimilar. Despite minor modifications within an increasingly sophisticated generic series, the plesiomorphic form of both gnathopods may be described as weakly subchelate, with slender carpus and propod, and clearly not sexually dimorphic. Within the Lysianassoidea, mating takes place freely and rapidly in the water column, there is no pre-amplexus or mate-guarding phase, and by corollary represents the plesiomorphic reproductive (mating) behaviour.

Amphipod superfamilies grouped within the category Natantia (Table I, p.67) are typified by pelagic reproductive (mating) behaviour, and by nonsexually dimorphic gnathopods that are primitively weakly subchelate and subsimilar in form. Exceptions can be explained, at least tentatively, on the basis of (1) independent or convergent evolution within geographically isolated sub-taxa that have been exposed to similar, mainly ecological, evolutionary stresses (e.g., southern families of Oedicerotoidea); (2) a morphological vestige of presumed ancestral types whose evolutionary "thrust" devolved mainly into other superfamily groups that are, today, essentially "reptant" in reproductive life style (e.g., in Pontoporeiidae); or (3) a probable extant precursor of more widespread and diverse modern taxonomic groups (e.g., in Dexaminoidea, Melphidippoidea).

Within subcategory Reptantia, gnathopod morphology is basically different, and the range of morphotypes is considerably greater than seen in the Natantia (Bousfield & Shih 1994). Thus, in most component superfamilies the gnathopods are characteristically sexually dimorphic and strongly subchelate or cheliform, especially in males. However, many exceptions to these overall trends have been noted. These plausibly include a secondary use of sedimentary benthic substrata as a "fluid" mating medium wherein sexually dimorphic gnathopods and pre-amplexing mating behaviour may not be required (e.g., in Haustoriidae).

In summary, within component superfamilies of Reptantia, sexual dimorphism of the gnathopods, and benthic pre-amplexing reproductive styles are typical. These types are mainly vegetatively free-living and epigean in physically rigorous habitats such as coastal shallows, estuaries, and fresh-watcrs. Conversely, in members that have become secondarily commensal with other marine animals or plants, penetrated into hypogean brackish- and fresh-water or the deep sea, or have become fully terrestrial, sexual dimorphism of the gnathopods is markedly reduced or lacking. Secondarily and neotenically, the sexually dimorphic form may revert to a morphology suited to the vegetative life style of both sexually mature adults and immature stages.

Mating Behaviour Within the Amphipoda

The significance of precopulatory mating behaviour and sexual dimorphism in phyletic relationships of amphipod crustaceans has been broadly investigated by Conlan (1991) and summarized by Bousfield & Shih (1994). To ensure proximity of males and females at the time of female ovulating ecdysis, amphipods employ two basic reproductive strategies: (1) mate-guarding, in which the males are either (a) carriers involving pre-amplexing, with concomitant modification of male gnathopods for the purpose, or (b) attenders, where they remain domiciled with the fe-

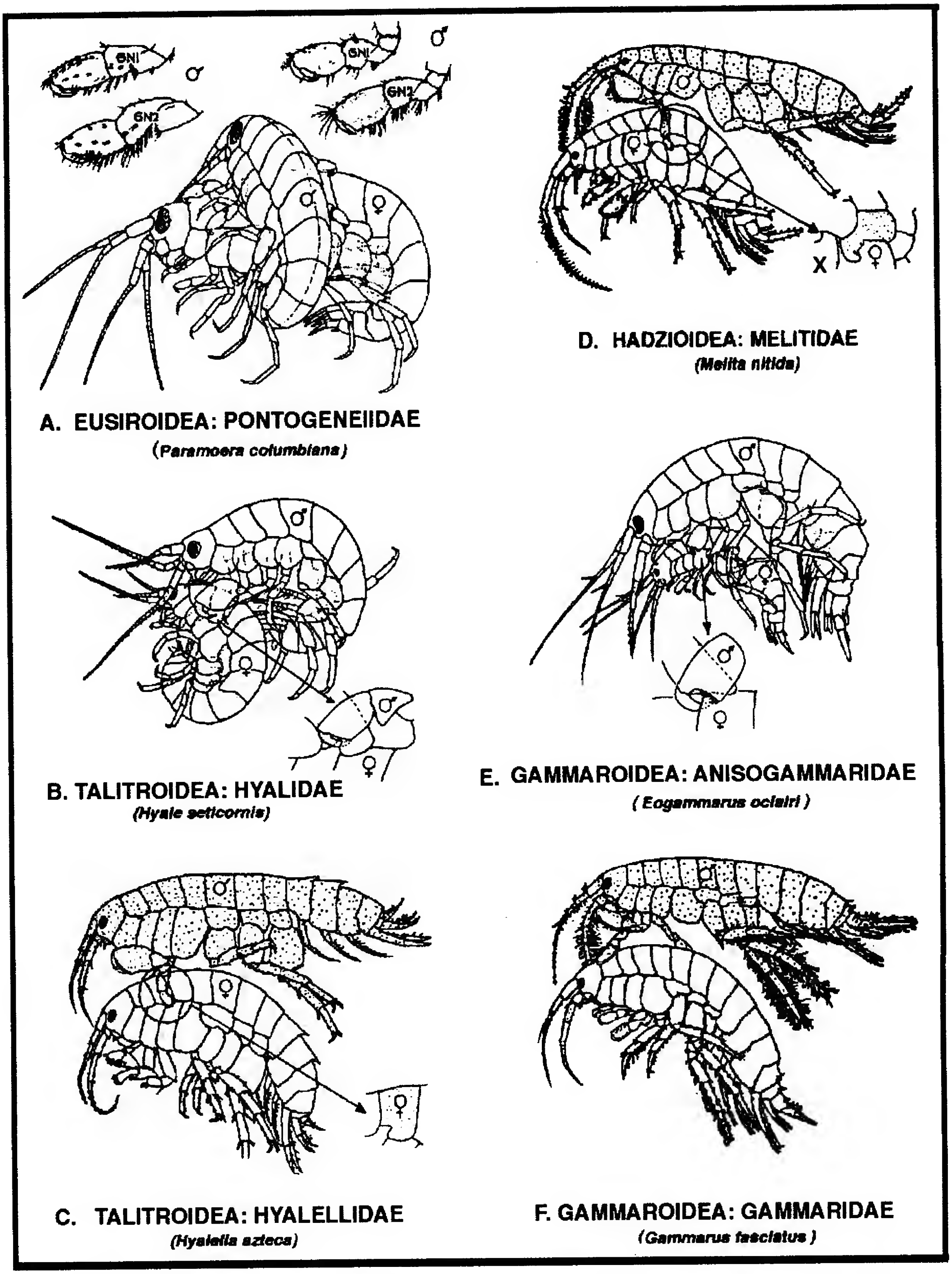

Fig. 6. Precopula in representative superfamilies of gammaridean Amphipoda. (after Bousfield & Shih 1994)

male and employ the gnathopods mainly in agonistic manner to ward off competing males.

(2) non-mate-guarding, in which the mature male simply seeks out females wherever they may be at the time of ovulation. These males are classified as (a) pelagic searchers if the female is in the water column, or (b) benthic searchers if the female is on or in the bottom substrata. In either case the gnathopods are little or not sexually dimorphic, and no pre-amplexus takes place.

Both strategies are determined by the period of ovulation of the female, at which time the male must be present if fertilization of the eggs is to take place. For a short period immediately following moulting, the cuticle of the female is sufficiently flexible to allow for release of the eggs into the brood pouch or marsupium. Sperm is deposited there by the male during copulation, and fertilization of the eggs can then take place.

Conlan (1991) concluded that the searching strategy is a primitive, and mate-guarding an advanced, form of reproductive behaviour in amphipods. This conclusion provides the principal basis for the present updated semi-phyletic classification of amphipod superfamilies (Table I, p. 67).

In these mating strategies, the reproductive morphology of the mature female is seldom significantly different from that of the vegetative or feeding stages, except in some species of *Melita* and some aquatic talitroideans where the coxae are modified to accept the dactyl of the precopulatory gnathopod of the male. However, the breeding frequency and fecundity reflect overall differences in mating strategy. Thus, females of mate guarders tend to be iteroparous, with several broods in a lifetime, whereas non-mate-guarders tend to be semelparous, with only one brood in a lifetime.

In the most primitive superfamily groups within Natantia, contact between the mate-seeking male and the female takes place only during actual copulation, and its duration is brief (Conlan 1991). These positions have been illustrated for a number of representative families and superfamilies of both Natantia and Reptantia. (Bousfield & Shih 1994). The positions vary according to the relative size of males and females, and on environmental conditions. All ensure rapid sperm transfer at the time of the female's ovulation moult.

Some pre-amplexing positions are illustrated in Fig. 6. Preamplexing is rare within superfamilies of Natantia, and where it does occur briefly, differs little from that of amplexus. Within Reptantia, however, pre-amplexus is nearly the rule. In the primitive Gammaroidea, males of Anisogammaridae (e.g., *Eogammarus oclairi*, Fig. 6E) grasp the smaller female by the base of coxa 4, usually by means ofgnathopod 1. In family Gammaridae (e.g., *Gammarus*, Fig. 6F), the male carries the female by means of a "fore-and aft" clutching of the anterior edge of peraeon plate 1 and posterior edge of peraeon 5, facilitiated by the very oblique palm of gnathopod 1. Within the Hadzioidea, the male of *Melita nitida* (Fig. 6D) employs his small gnathopod 1 to grasp the female by the specially modified anterior lobe of coxa 6. His much enlarged gnathopod 2 may be used in fending off competing males. In many aquatic Talitroidea, especially in *Hyalella* and *Allorchestes* (Hyalellidae, Fig. 6C) and in *Hyale* and *Parallorchestes* (Hyalidae, Fig. 6B), the dorsally positioned male inserts the dactyl of gnathopod 1 in a precopulatory notch in the lower anterior margin of peraeon 2 of the smaller female. Again, the much enlarged gnathopod 2 apparently functions agonistically towards other males. In some species of *Hyale*, however, the dactyl of gnathopod 2 may be used in grasping and/or rotating the female.

The widespread phenomenon of convergent evolution of high-level characters states is well illustrated by these superficially similar mating strategies, that differ morphologically and tactically at family and subfamily levels.

The Phylogenetic Tree.

Possible natural relationships among subordinal and superfamily groups may be represented in the form of a phylogenetic tree (Fig. 7). This dendrogram is modified from Bousfield & Shih (1994) to include superfamilies Iphimedioidea Lowry and Myers, 2000 and Stenothoidea Bousfield, 2000, and reflect the influence of additional characters and character states. The plesiomorphic character states, especially of the antennal sensory organelles, are most strongly evinced in taxa, extant or extinct, that are closest to the trunk and main branches. The apomorphic or advanced and specialized features are best developed in taxa placed near the branching extremities. The phylogenetic "tree" may be viewed, in effect, as a form of cladogram in which the character states are ordered and arranged "parsimoniously", but without numerical basis.

The present version is little changed from the earlier tree (1994). During the past 10 years the number of species in each group has increased, variously, by only about 5-10%, few major new taxa have been discovered, and the ordering of character states has remained basically unchanged. However, as noted above (Fig. 4) the form of the rami of uropods 1 & 2 have here been

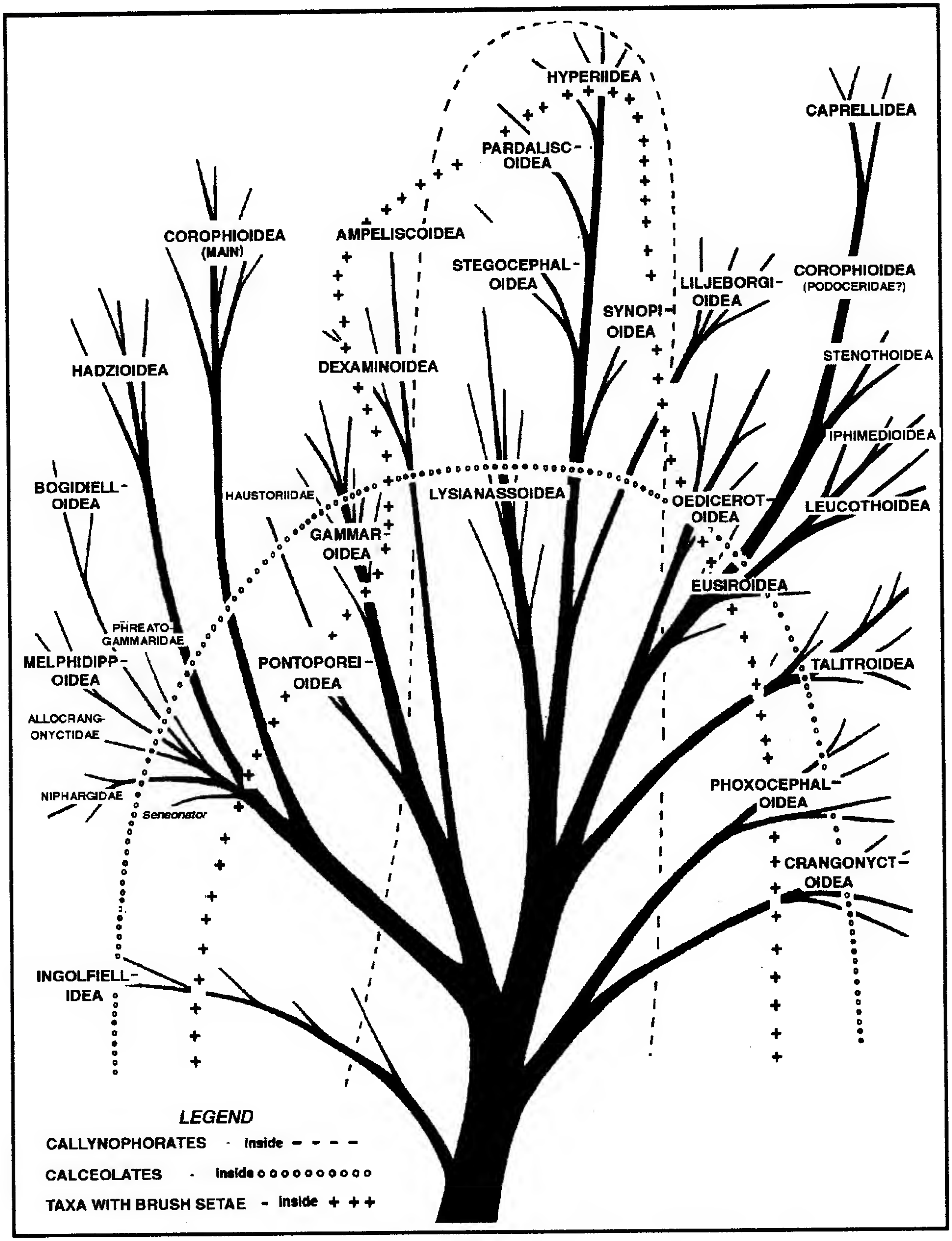

Fig. 7. Phylogenetic tree of suggested natural relationships within suborders and superfamilies of the Amphipoda (modified from Bousfield & Shih 1994).

suggested as significant indicators of phyletic relationships. The degree of anterolobation of coxae 5 & 6, and of heteropody of pereopods 5-7, deserve further study as indicators of phyletic significance. Emphasis on such parameters has here altered the position of the main trunk which now centrally subtends superfamilies of Natantia leading to the Hyperiidea, the most highly modified (advanced) of fully natatory taxa.

The phyletic position of the Liljeborgioidea, a group not yet rigorously defined, remains uncertain. North American family inclusions (p.100) are mainly benthic, commensal, deep-demersal, or hypogean in fresh water. Antennal reproductive sensory organelles are lacking in all subgroups, and most have developed sexually dimorphic gnathopods and pre-amplexing mating behaviour. Paradoxically it seems, component families retain lanceolate or transitional type uropod rami, posterolobate or weakly anterolobate coxae 5 & 6, and peropods 5-7 are basically homopodous. Other enigmatic family- or perhaps superfamily-level groups elsewhere include the Niphargidae, Phreatogammaridae, and the monotypic *Sensonator valentiensis* Notenboom, 1986.

In phylogentic analysis of the 10 suborders of the Isopoda, Brusca & Wilson (1991) have employed cladistic methodology leading to major classificatory recommendations. However, the universal applicability and adequacy of cladistic analyses for this purpose has been questioned by some (e.g., Gosliner & Ghiseln 1984). Relative to the taxonomically "difficult" order Amphipoda, the superficially similar peracaridan order Isopoda is more uniformly benthic in life style, with much greater development of both external and internal parasitic forms. It is palaeohistorically more ancient (Bousfield & Conlan 1990), and thus with perhaps fewer "intermediate" stages that frustrate creation of neatly defined phyletic units based on one or two character states only.

A full cladistic analysis of the Amphipoda is beyond the scope of this paper. Serious problems concerning character state homoplasy, and the status of so-called "intermediate" taxa have yet to be resolved (e.g., in Berge et al 2001). However, a phyletic tree based on "first principles" here provides a useful visual basis for eventual numerical establishment of a true phyletic classification of the Amphipoda.

PHYLETIC ARRANGEMENT OF HIGHER TAXA

The present phyletic classification of higher amphipod taxa (Table I) is based on relatively few characters and character states, most of which exhibit high classificatory value. The North American species list (Appendix I, p. 75) follows this arrangement of higher taxonomic names.

The present analysis recognizes the Ingolfiellidea and Gammaridea as distinct and valid subordinal divisions of Order Amphipoda. However, the Hyperiidea and Caprellidea are of lesser significance, here submerged within subcategories of Natantia and Reptantia, respectively. This conclusion agrees in part with the results of a limited cladistic anlysis of the Amphipoda by Berge et al (2001). That study likewise combines hyperiids and caprellids variously within the Gammaridea, but is less demonstrative of the subordinal distinctness of the Ingolfiellidea.

Within suborder Gammaridea, the pragmatic terms "Natantia" and Reptantia" continue to encompass almost the same superfamily groups as earlier proposed (Bousfield & Shih 1994). Introduction of the form of the rami of uropods 1 & 2 as primary phyletic indicators reinforces the applicability of those subcategories, at least on a semi-phyletic basis. Thus, the newly proposed uropod-descriptive terms "Lanceolata" and "Lineata", are essentially interchangeable with the original terms "Natantia" and "Reptantia", since they encompass virtually the same respective superfamily goups.

Two major subgroups may be recognized within the Natantia: the primary Lanceolata, and the transitional Lanceolata. Member of the former are typically fully marine, have a mainly free-swimming life style, their antennal sensory organelles are well-developed, but the gnathopods are not sexually dimorphic. The "Transitionals" are not strictly marine, exhibit a wider variety of benthonic (commensal) life styles, and exhibit varying loss of antennal organelles, but corresponding development of sexually dimorphic, preamplexing gnathopods.

The Reptantia may be subdivided into: (1) primitive superfamilies having posterolobate coxae 5 & 6, and (2) advanced superfamilies in which these coxae are mainly anterolobate. The more primitive "anterolobates" encompass the pontoporeioidean and gammaroidean superfamilies ("gammarida" of Barnard & Barnard 1983). The advanced "anterolobates" contain the most highly evolved groups of gammaridean amphipods, marked by very specialized morphologies and life styles.

As noted above, the position of the Liljeborgioidea remains enigmatic. In conspicuous morphological character states and life style, component members seem clearly assignable to the "Reptantia". However, the condition of the posterior peraeopods and uropod rami is plesiomorphic and characteristic of most "Natantia". A tentative, but not entirely satisfactory solution is to place the Liljeborgioidea among the "Advanced Transitionals" within Natantia (Table I).

In early phyletic studies (e.g., Bousfield 1979, 1983), the author utilized several other external morphological features, some of which tend to support the present categories. Thus, members of the Natantia usually possess a distinct rostrum, coxal gill on per-aeopod 7, well-developed natatory uropod 3, but relatively short antenna 1; in the Reptantia, however, the rostrum, and coxal gill of peraeopod 7 are usually lacking, uropod 3 is often reduced and non-natatory, and antenna 1 is usually elongate.

Sternal gills, of various form and presumed osmoregulatory function, occur only in freshwater taxa, but may have phyletic significance nonetheless. Thus, within Natantia, all superfamilies that encompass freshwater families and genera contain some species bearing sternal gills (e. g., in *Gammaracanthus, Pseudamoera,* and *Falklandella* within Eusiroidea; *Paracalliope* within Oedicerotoidea; *Phreatogammarus* within Melphidippoidea; and *Paracrangonyx* within Liljeborgioidea). In the Reptantia, however, sternal gills are characteristic of the more primitive superfamilies Crangonyctoidea (all families), Talitroidea (Hyalellidae), and Pontoporeioidea (*Monoporeia, Diporeia*). Sternal gills are lacking in all freshwater gammaroideans and hadzioideans (e.g., weckeliids, pseudoniphargids), to which may be added the European-Mediterranean regional species of Niphargidae, *Sensonator,* and all members of superfamily Bogidielloidea.

Attempts at utilizing other seemingly phyletically promising characters and states have proven frustrating and ineffective, largely because of homoplasious character state similarities at superfamily level. Mouthpart morphology tends to reflect feeding style and is thus useful mainly in family level classification [e. g., in Stegocephalidae (Berge 2000)]. Seemingly "in defiance of" other phyletic trends across both Natantia and Reptantia, the morphology of female brood lamellae varies between the broad, marginally setose, presumed plesiomorphic condition, and the narrow, strap-like, apomorphic form.

A very few characters have been little utilized to date, and may merit further investigation. Pleopod morphology is seldom figured or described in detail, especially in the early literature. What little is known of their character states (e.g., type of retinacula, "clothes-pin spines") tends to be conservative "across the taxonomic board". Small morphological differences may therefore be significant at high classificatory level. Presence or absence and size of the accessory flagellum seems not phyletically accountable; its length appears secondarily increased in some deepwater gammarids of Lake Baikal. However, its position of origin (anterior in some Phoxocephalidae and Liljeborgiidae, mediolateral in nearly all other taxa) merits further study. Character states of surface ultrastructure are little known but may be especially promising as phyletic indicators when the difficulties of terminology and function have been resolved (Halcrow & Bousfield 1987).

CONCLUSIONS

Analysis of plesio-apomorphic conditions of selected external morphological characters and reproductive behaviour has resulted in a revised classification of the amphipod Crustacea. Introduction of new characters has lent support to recognition of only two suborders, the primitive Ingolfiellidea, and the more advanced and much more diverse Gammaridea. The analysis also lends further support to the phyletic significance of previous gammaridean subcategories "Natantia and "Reptantia", interchangeable with newly proposed terms "Lanceolata" and "Lineata" respectively. These basic gammaridean morphotypes are represented in Fig. 8 as an assist to vizualizing or conceptualizing morphological relationships among the species of North American amphipods (Appendix I).

Because of homoplasious occurrence of some character states "across the taxonomic board", these subcategory names combine elements of phyletic significance with pragmatic usefulness. Cognizance of such variation within all component species requires that superfamilies be realistically diagnosed by a "best-fit" consensus of character states, rather than by rigorous conformity to one or two morphological criteria.

The classification outlined in Table I may be used as a form of "key" to subordinal and superfamily groups listed in Appendix 1. This extensive list of marine, brackish, freshwater and terrestrial species contains all known suborders and superfamilies, and many of the families allocated to each superfamily (see Martin & Davis 2001).

Phyletic classification has many advantages, not the least of which is conformity with phyletic classifications elsewhere within Class Crustacea, and major ordinal groups within the Animal Kingdom. Superfamily grouping of the North American fauna (Appendix I) has also facilitated comparative biogeogeographical

TABLE I. Phyletic Classification of the Amphipoda suggested by character states of the uropods superimposed on those of reproductive morphology and belaviour, and other characters.

I. AMPHIPODA INGOLFIELLIDEA (uropod 2 >1; eyes stalked; maxillipeds partly separated basally; peduncle 3 of antenna 2 elongate, body vermiform; 2 families - hypogean, marine and freshwater).

II. AMPHIPODA GAMMARIDEA (uropod 1 > 2; eyes sessile; maxillipeds fused basally; peduncle 3 of antenna 2 not elongate; ~150 families - epigean and hypogean, marine, freshwater, and terrestrial).

A. LANCEOLATA (=NATANTIA) (rami of both uropods 1 & 2 lanceolate, often with serially arranged marginal spines and lacking apical spines; antennae strongly sexually dimorphic, male with sensory antennalorganelles; gnathopods not (or weakly) sexually dimorphic; uropod 3 usually large,biramous).

I. **Basic Lanceolates** (uropods 1 & 2 rami lanceolate; gnathopods not sexually dimorphic).

1. **Callynophorates** (with antennal callynophore and brush setae in male)
Lysianassoidea (antennae calceolate, head not rostrate)
Pardaliscoidea; Stegocephaloidea: Hyperiidea (non-calceolate; head rostrate)
Hyperiidea (maxilliped lacking palp; coxae 1-4 small; A2 short in female)
Synopioidea (callynophore weak or non-existant, but brush setae present);

2. **Phoxocephaloideans** (callynophore seldom and brush setae infrequent; calceoli plesiomorphic, receptacle and bulla lacking, body with few distal elements; head strongly rostrate; peraeopod 5 dactylate); 5 families ,fossorial, marine, mainly antiboreal).

II. **Transitionals** (uropods 1 & 2 transitional in form; callynophore & brush setae reduced or lacking,; gnathopods weakly sexually dimorphic, or not).

3. **Primitive Transitionals** (antennae often calceolate, coxae 5 & 6 posterolobate)
Eusiroidea (mostly pelagic; pereopods 5-7 homopodous, segment 4 produced behind)
Oedicerotoidea (fossorial; peraeopods 5 & 6 homopodous, P7 elongate; gnathopods sexually dimorphic in 2 families).
Leucothoidea (benthonic) (uropod 3, outer ramus 1-segmented; gnathopod rarely sex. dimorph.)
Iphimedioidea (benthonic): uropod 3, outer ramus 1-segmented, gnathopods weak not dimorph).
Stenothoidea (benthonic), uropod 3, outer ramus 2-segmented; gnathopod often sex. dimorphic)

4 **Advanced Transitionals** (male antennae non-calceolate,with brush setae, callynophore rare; coxae 5 & 6 anterolobate, uroppod 3 biramous, often natatory)
Dexaminoidea and Ampeliscoidea (urosome 2 & 3 fused; U3 rami large, natatory)
Melphidippoidea: (urosome 2 & 3 separate; U3 lanceolate, weakly sexually dimorphic)
Liljeborgioidea (gnathopods sexually dimorphic; life style commensal or freshwater hypogean.

B. LINEATA (=REPTANTIA) (uropod rami linear, with apical spines, lateral marginal spines irregular; gnathopods sexually dimorphic, usually strongly; usally benthic reproductive behaviour)

I. **Posterolobate reptants** (Coxae 5 & 6 posterolobate; uropod 3 short, rami reduced)
Crangonyctoidea (Antenna 1 elongate, wth accessory flagellum; A2 calceolate in male);
Talitroidea (Antenna 1 the shorter, lacking accessory flagellum; A2 non-calceolate)

II. **Anterolobate Reptants** (Coxae 5 & 6 anterolobate; uropod 3, one or both rami large)

1. **Primitive Anterolobates** (telson bilobate; free-swimming. free-burrowing,or commensal)
Pontoporeioideans (appendages fossorial, P5 adactylate; gnathopods weakly or not sexually dimorphic; may retain pelagic reproduction, with primitively calceolate antenna 2 (male)
Gammaroideans (appendages seldom fossorial; gnathopods subsimilar in size and sexually dimorphic; antennae weakly or not calceolate, coxal gill on peraeopod 7; mainly freshwater)
Hadzioideans (appendages rarely fossorial; antennae not calceolate; gnathopods unlike and strongly sexually dimorphic; antennae not calceolate; P7 lacking coxal gill; marine and brackish)

2. **Advanced Anterolobates** (telson plate-like or entire; domicolous or excl. hypogean life style)
Bogidielloideans (vermiform; uropod 3 subequally biramous; telson plate-like; f.w. hypogean).
Corophioideans (body depressed; peraeopods 3 & 4 glandular; uropod 3 reduced, telson fleshy. animals marine, domicolous (tube-buidling); male gnathopods mate guarding).
Caprellideans (body slender, cylindrical; coxae lacking; abdomen vestigial; marine, epigean, semi-sessile; 2 infrorders: Caprellida (skeleton shrimps) and Cyamida (whale lice).

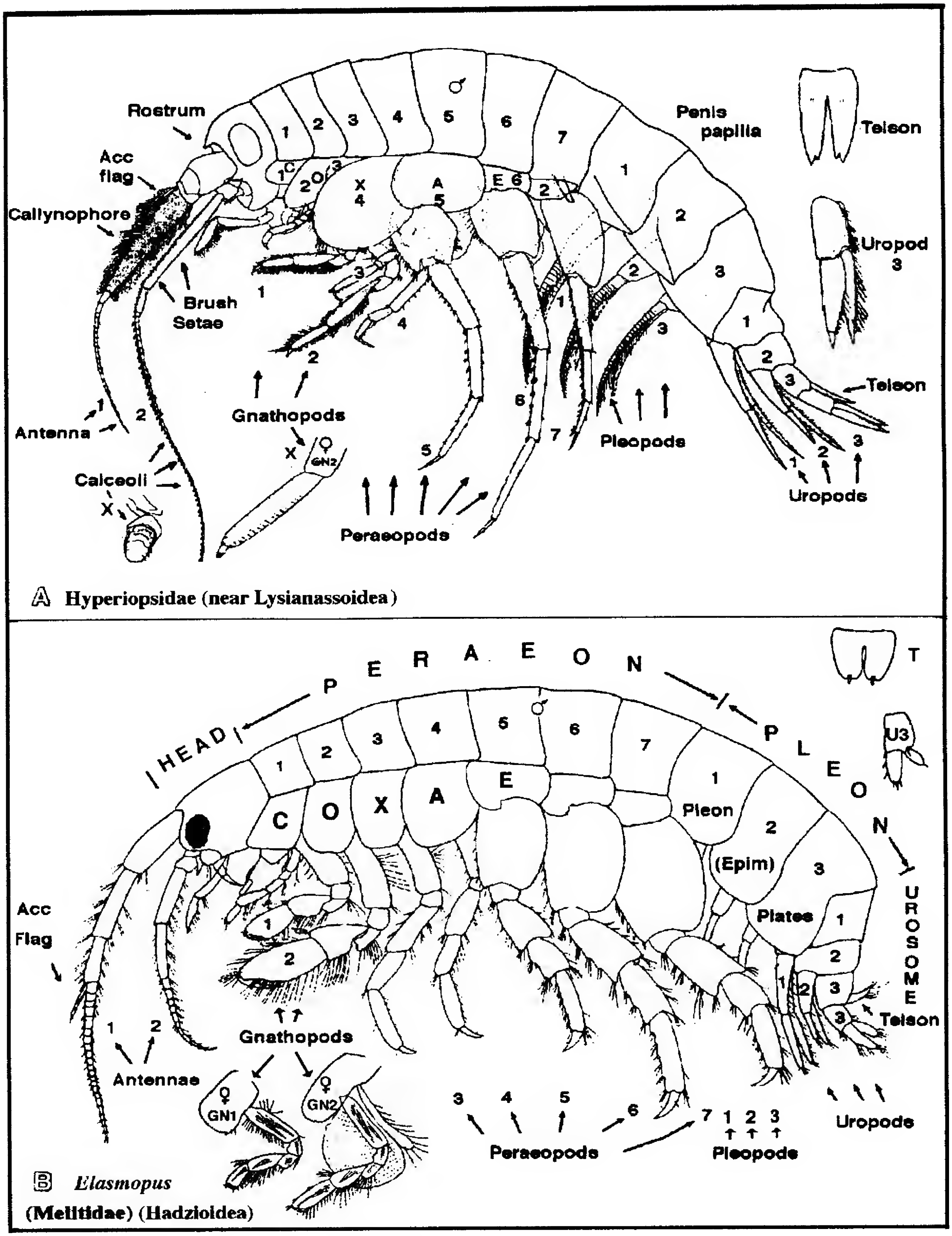

Fig. 8. Representative morphotypes of basic categories of phyletic classification of the Amphipoda A. Lanceolata (=Natantia). B. Lineata (=Reptantia) (after Bousfield & Shih 1994).

analysis of subregional faunas (Bousfield 2001). In summary, Arctic and Pacific coastal marine amphipod faunas are relatively primitive, possibly reflecting the long-term (biohistorical) stability of those regions. The east coast faunas are more advanced, compare phyletically with those of the Mederranean region, and presumably reflect the relatively recent origin of the North Atlantic Ocean (since late Jurassic). Gulf coast amphipods encompass the highest percentage of advanced, and lowest percentage of primitive superfamilies, consistent with its relatively high year-round temperature regime. Thus, within the Amphipoda, evolution of apomorphic features (e.g., sexually dimorphic gnathopods) "classically" proceeds most rapidly in tropical regions; conversely, plesiomorphic features (e.g., antennal sensory organelles) are most frequently retained in cold-water regions and in the deep sea where evolutionary rates are presumably much slower. This biogeographic-phyletic analytical methodology has been extrapolated from North American superfamily groups to other well-studied regional faunas to conclude that the world's most primitive marine assemblages presently occur in the Antarctic.

The North American freshwater amphipod fauna is much more diverse than was believed during the mid 1900's, thanks mainly to the extensive recent work of Dr. John R. Holsinger and colleagues, with much new material yet to be published (per. commun.). It contains a high percentage of ancient relict types with sternal gills, dominated in hypogean habitats by members of the Crangonyctoidea, and in epigean habitats by the exclusively neotropical Hyalellidae (Bousfield 1996) and the arctic-boreal pontoporeioidean genus *Diporeia* (Bousfield 1987). The more modern gammaroideans and hadzioideans, lacking sternal gills, are widely diverse throughout Eurasia. In North America, however, these advanced groups are represented only peripherally, and by small numbers of species and few families, of which some are recently introduced (e.g., Witt et al, 1997). A few relict species within Gammaracanthidae, Sebidae, and Bogidiellidae complete the North American freshwater complex.

The need for full return to phyletic classication of the Amphipoda, inevitable though it may be, remains urgent. Present analysis indicates that a fully satisfactory phyletic classification still eludes us. Cladistic methodology (e.g., Berge et al, 2001) has not yet solved the problem of suitable outgroups and/or homoplasious occurrence of character states widely accross the taxonomic board. The problem may yet be solved through pooling of results from all analytical methodology, and employment of some of the characters and character states here developed. Especially promising is genetic methodology, both DNA hybridization and rDNA sequencing (Schram, Duffy, pers. commun.). Although these methodologies have special limitations of their own, they seem minimally affected by homoplasy of external character states, thereby providing a more reliable basis for phyletic classification. The present arrangement of superfamilies is not fully phyletic and is far from a final answer. It is proposed as a potentially useful platform upon which may be reconstructed a probable pathway of morphological evolution within the amphipod crustaceans.

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APPENDIX I.
PHYLETIC LIST OF AMPHIPOD CRUSTACEA OF NORTH AMERICA, NORTH OF MEXICO.

The study of phyletic classification presented in the main text was developed mainly through analysis of North American species listed here. The North American amphipod fauna contains about 1650 species, representative of all known suborders and superfamilies, about 2/3 of families, and perhaps 1/4 of the total number of species world-wide. As noted in the acknowledgements (p. 50), the list was developed, over a 15-year period, by a subcommittee of the Committee on Scientific and Common Names of Aquatic Invertebrates, chaired by Dr. Donna D. Turgeon, NOAA, Washington, D. C. The list encompasses marine, brackish, freshwater and terrestrial faunal components. An additonal ~200 species have been recognized from continental North America north of Mexico, including Canada and Alaska, but not Greenland, Bermuda, or the Bahamas. Others are known from the U. S. mid-Pacific state of Hawaii. These undescribed taxa are in the process of being treated by systematic specialists. Their work will be added to an updated final list, including common names where possible, to be published in a special volume on the Crustacea of North America jointly sponsored by NOAA and the American Fisheries Society.

The system of higher classification of amphipods of this list is essentially phyletic, including superfamily level taxa, following standards proposed for Ingolfiellidea by Stock (1977), Hyperiidea by Bowman & Grüner (1973); Caprellidea by Laubitz (1993) and Gammaridea by Schram (1986), updated by Bousfield and Shih (1994) and Bousfield (2000).

Although the arrangement of superfamilies follows that of Table I of the main text (p. 67), the component families and genera are listed alphabetically. Newly proposed subordinal categories of classification are omitted for the present, but if reasonably widely accepted by colleagues, may be introduced in the final CNAI crustacean volume. The former subordinal-level names Hyperiidea and Caprellidea are retained in situ within the list, mainly for pragmatic reasons, even though they have been merged within suborder Gammaridea. The merged older names have yet to be reassessed at suitable classificatory levels.

As noted above, the phyletically arranged list of North american amphipods provides a basis for biogeographical analysis of it subregional marine and freshwater faunas. This study, currently in press (Bousfield 2001b), also contains a detailed numerical analysis of numbers of species by subregion, superfamily, and family level categories.

Ocurrence Legend

A	-	**Arctic**
AC	-	**Acadian**
At	-	**Atlantic**
AL	-	**Alaska**
ALEUT	-	**Aleutians**
BAR	-	**Pt. Barrow**
BC	-	**British Columbia**
BER	-	**Bering Sea**
C	-	**Carolinian**
CAL	-	**California**
CHES	-	**Chesapeake Bay**
CUBA	-	**Cuba**
E	-	**Eastern**
FL	-	**Florida**
G	-	**Gulf of Mexico**
HAT	-	**Cape Hatteras**
HAW	-	**Hawaii**
LA	-	**Louisiana**
LABR	-	**Labrador**
MI	-	**Mississippi**
N	-	**Northern**
NC	-	**North Carolina**
NFLD	-	**Newfoundland**
P	-	**Pacific**
ORE	-	**Oregon**
SE	-	**Southeastern**
ST L	-	**St. Lawrence Gulf**
V	-	**Virginian**
WA	-	**Washington State**
FW	-	**Freshwater**
ST	-	**Semiterrestrial**
T	-	**Terrestrial**
TEX	-	**Texas**
W	-	**Western**
YUC	-	**Yucatan**

SCIENTIFIC NAME	OCCURRENCE

SUBORDER INGOLFIELLIDEA HANSEN, 1903

Family Ingolfiellidae Hansen, 1903

Ingolfiella fuscina Dojiri & Sieg, 1987	At-G (SC-W FL)

SUBORDER GAMMARIDEA LATREILLE, 1803

Superfamily Lysianassoidea (Bousfield, 1979; Lowry & Stoddart, 1997)

Family Lysianassidae Dana, 1849

Subfamily Lysianassinae Dana, 1849

Acidostoma laticorne G. O. Sars, 1879	At (N, slope)
Aruga oculata Holmes, 1908	P (CAL
A. holmesi (Barnard, 1955)	P (WA-CAL), G (W FL)
Bonassa bonairensis (Stephensen, 1933)	G (FL)
Concarnes concavus (Shoemaker, 1933)	G (FL)
Dissiminassa homosassa Lowry & Stoddart, 1997	G (FL)
D. dissimilis (Stout, 1913)	P (S CAL)
Eclecticus eclecticus Lowry & Stoddart, 1997	G(FL)
Lysianopsis alba Holmes, 1903	At (V-C), G (FL)
L. cubensis Shoemaker, 1933	G (FL.)
L. hummelincki (Stephensen, 1933)	G (FL)
L. ozona Lowry & Stoddart, 1997	G (W FL)
L. subantarctica (Schellenberg, 1931)	G (Fl-tropic?)
Macronassa macromera (Shoemaker, 1916)	P (S CAL)
M. pariter (J. L. Barnard, 1969)	P (CAL)
Menigrates obtusifrons (Boeck, 1861)	At (G, N, slope)
Shoemakerella cubensis (Stebbing, 1897)	G (W FL)
S. nasuta (Dana, 1853)	G (FL) (see Shoemaker, 1948)

Subfamily Tryphosinae Lowry & Stoddart, 1997

Allogaussia recondita Stasek, 1958	P (BC-CAL)
Hippomedon coecus (Holmes, 1908)	P (S CAL)
H. columbianus Jarrett & Bousfield, 1982	P (BC-ORE)
H. denticulatus (Bate 1857)	At (N, slope)
H. granulosus Bulycheva, 1955	P (BER-BC)
H. holbolli (Kroyer, 1946)	At (ST L)
H. pensacola Lowry & Stoddart, 1997	G (W FL)
H. propinquus Sars, 1890	At (ST. L-HAT)
H. serratus Holmes, 1905	At (AC-CHES)
H. subrobustus Hurley, 1963	P (CAL?)
H. tenax Barnard, 1966	P (S CAL?)
H. tricatrix Barnard, 1971	P (ORE, deep)
H. zetismus Hurley, 1963	P (CAL, deep)
Koroga megalops Holmes, 1908	P (BC-WA, offshore)

Lepidepecrella charno Barnard, 1966	P (CAL-deep?)
Lepidepecreoides nubifer Barnard, 1971	P (ORE-deep)
Lepidepecreum eoum Gurjanova, 1951	P (BER-CAL)
L. nubifer Barnard, 1971	P (ORE, deep)
L. garthi Hurley, 1963	P (BC-CAL)
L. gurjanovae Hurley, 1963	P (BC-CAL)
L. serraculum Dalkey, 1998	P ((CAL)
L. serratum Stephensen, 1925	At (G, N, slope)
Orchomenella decipiens Hurley, 1963	P (CAL)
O. holmesi (Hurley, 1963)	P (BC-CAL)
Orchomenella minuta (Kroyer, 1846)	P (AL-ORE)-A-At (ST L)
O. pacifica (Gurjanova, 1951)	P (BER-CAL)
O. perdido Lowry & Stoddart, 1997	G (W F)
O. thomasi Lowry & Stoddart, 1997	G (W FL)
Orchomene depressa Shoemaker, 1930	At (AC, shelf)
O. holmesi (Hurley, 1963)	P (CAL)
O. limodes Meador & Present, 1985	P (CAL)
O. macroserrata Shoemaker, 1930	At (AC, shelf)
O. magdalensis (Shoemaker, 1942)`	P (S CAL?)
O. nugax (Holmes, 1904)	P (BER-WA)
O. obtusa (Sars, 1891)	P (SE AL-CAL), At (ST L)
O. pectinata Sars, 1882	At (ST L)
O. serrata (Boeck, 1861)	At (AC-V)
Paralibrotus setosus Stephensen, 1923	At (ST L, slope)
Paratryphosites abyssi (Goes, 1866)	A-At (G-BCN)
Psammonyx longimerus Jarrett & Bousfield, 1982	P (BC-ORE)
P. nobilis (Stimpson, 1853)	At (AC-DEL)
P. terranovae Steele, 1979	At (AC-NFLD)
Rimakoroga floridiana Lowry & Stoddard, 1997	G (W FL)
R. rima (J. L. Barnard, 1964)	P (S CAL)
Schisturella pulchra (Hansen, 1887)	At ST L slope)
Tmetonyx cicada (Fabricius,1780)	At (ST L -AC)
T. gulosus (Kroyer, 1845)	At (ST L)
Tryphosella apalachicola Lowry & Stoddart, 1997	G (W FL)
T. compressa (Sars, 1891)	At (ST Lslope)
T. groenlandica (Hansen, 1887)	At (ST L slope)
T. gulosus (Kroyer, 1845)	At (N, slope)
T. index (Barnard, 1966)	P (CAL)
T. metacaecula Barnard, 1967	P (CAL)
T. nanoides (G. O. Sars, 1895)	At (St.L)
T. orchomenoides Stephensen, 1925	A-At
T. rotundata (Stephensen, 1923)	At (ST L, slope
T. spitzbergensis (Chevreux, 1926)	A-At (ST L, slope)
T. triangula (Stephensen, 1925)	At (ST L)
Wecomedon wecomus (Barnard, 1971)	P (SE AL-ORE)
W. similis Jarrett & Bousfield, 1982	P (BER-SE AL)
W. wirketis (Gurjanova, 1962)	P (BER-AL)

Family Uristidae Hurley, 1963

Anonyx adoxus Hurley, 1963	P (ORE-CAL)

A.	*barrowensis* Steele,1882	P-A (BAR)
A.	*beringi* Steele, 1982	P (BER)
A.	*comecrudus* J. L. Barnard, 1971	P (ORE)
A.	*compactus* Gurjanova, 1962	P (BER?), At (ST L)
A.	*dalli* Steele, 1983	P (BER?)
A.	*debruyni* Hoek, 1882	At (ST L)
A.	*epistomaticus* Kudrjaschov, 1965	P (BER?)
A.	*filiger* Stimpson, 1864	P (WA?)
A.	*hurleyi* Steele, 1986	P (AL?)
A.	*laticoxae* Gurjanova, 1962	P (BER?)
A.	*lilljeborgi* Boeck, 1871	P (AL-CAL)-A-At (AC)
A.	*makarovi* Gurjanova,1962	P (BER)A-At (ST L)
A.	*m. nugax* (HYBRID, Brunel MS))	At (ST L)
A	*nugax* (Phipps, 1774)	P (BER-CAL?)-A-At
A.	*ochoticus* Gurjanova, 1962	P (BER?)-A-At
A.	*pacificus* Gurjanova, 1962	P (AL-WA)
A.	*petersoni* Steele, 1986	P (BER?)
A.	*schefferi* Steele, 1986	P (AL?)
A.	*sculptifer* Gurjanova, 1982	P (BER?)
A.	*shoemakeri* Steele, 1983	P (BER?)
Centromedon pavor Barnard, 1966		P (ORE-CAL)
C.	*pumilus* (Liljeborg, 1865)	At (ST L)
Euonyx laquaeus Barnard, 1967		P (deep)
Gronella groenlandica (Hansen, 1887)		At (ST L)
Hirondellea fidenter Barnard, 1966		P (CAL)?
Kyska dalli Shoemaker, 1964		P (ALEUT)
Onisimus (Onisimus) litoralis (Kroyer, 1845)		A-At (N)
Onisimus (Boekosimus) edwardsi (Kroyer, 1846)		At (G, N)
O. (B.)	*glacialis* (G. O. Sars, 1900)	At (G)
O. (B.)	*normani* (Sars, 1891)	At (ST L slope)
O. (B.)	*plautus* (Kroyer, 1845)	At (ST L slope)
Paronesimus barentsi (Stebbing, 1894)		A-At (N, slope)
Paratryphosites abyssi (Goes, 1866)		At (deep)
Schisturella cedrosiana Barnard, 1967		P (CAL)
S	*cocula* Barnard, 1966	P (BC)
S.	*dorotheae* (Hurley, 1963)	P (CAL)
S.	*grabenis* Barnard, 1967	P (deep)
S.	*totorami* Barnard, 1967	P (CAL)
S.	*tracalero* (Barnard, 1966)	P (S CAL)
S.	*zopa* Barnard, 1966	P (S CAL)
Sophrosyne robertsoni Stebbing & Robertson, 1891		P (CAL)
Stephonyx biscayensis (Chevreux, 1908)		G (FL)
U.ristes californicus Hurley, 1963		P (CAL)
U.	*dawsoni* Hurley, 1963	P (CAL)
U.	*entalladurus* Barnard, 1963	P (CAL?)
U.	*perspinus* Barnard, 1967	P (ORE, deep)
U.	*umbonatus* (Sars, 1882)	At ST L slope)

Family Scopelocheiridae Lowry & Stoddart, 1997

Paracallisoma coecum (Holmes, 1908)	P (AL-BC, offshore)

Family Trischizostomatidae Lilljeborg 1865

Trischizostoma sp. (Bousfield, 1987 proposed)	P-At (AL-CAL, deep)

Family Opisidae Lowry & Stoddart, 1995

Opisa eschrichti Kroyer 1842	P (BC-CAL), At (AC)
O. tridentata Hurley, 1963	P (BC- CAL)
O. odontochela Bousfield, 1987	P (SE AL-BC)

Subfamily concept Conicostomatinae Lowry & Stoddart proposal; Barnard & Karaman 1991?

Acidostoma hancocki Hurley, 1963	P (BC-CAL)
A. obesum subsp. *ortum* J. L. Barnard, 1967	P (CAL, deep)
Ocosingo borlus Barnard, 1964 (= *Fresnillo* Barnard)	P (BC-CAL)
Pachynus barnardi Hurley, 1963	P (WA-CAL)
Prachynella lodo Barnard,1964	P (WA-CAL)
Socarnes hartmanae Hurley, 1963	P (CAL)
S. vahli (Kroyer, 1838)	At (ST L, slope)
Socarnoides illudens Hurley, 1963	P (ORE-CAL)

Family Cyphocarididae Lowry & Stoddart, 1997

Cyclocaris guilelmi Chevreux, 1899	P (SCAL?)
Cyphocaris challengeri Stebbing, 1880	P (AL-CAL)
C. faurei K. H. Barnard, 1918	P (S CAL?)
C. guilelmi Chevreux, 1899	P (AL-CAL)
C. richardi Chevreux, 1905	P (BC-CAL)
C. anonyx Boeck, 1871	P (BC, offshore)
C. tunicola Lowry & Stoddart, 1997	G (W FL)
Metacyphocaris helgae Tattersall, 1906	P (AL-CAL)

Family Aristiidae Lowry & Stoddart, 1997

Aristias captiva Lowry & Stoddart, 1997	G (W FL)
A. expers Barnard, 1967	P (CAL?)
A. pacificus Schellenberg, 1936	P (BC-WA)
A. topsenti Chevreux, 1900	At ST L, slope)
A. tumidus (Kroyer, 1846)	P (WA), At (ST L, slope)
A. veleronis Hurley, 1963	P (BC-CAL)
Boca campi Lowry & Stoddart, 1997	G (W FL)
B. elvae Lowry & Stoddart, 1997	G (E & W FL)
B. megachela Lowry & Stoddart, 1997	G (W FL)

Family Endevouridae Lowry & Stoddart, 1997

Ensayara entrichoma Gable & Lazo-Wasem, 1990	G (W FL)
E. ramonella Barnard, 1964	P (S CAL?)

Family Hyperiopsidae Bovallius, 1886
(near Cyphocarididae Lowry & Stoddart?)

Parargissa americana Barnard, 1961	P (CAL, BC, deep)
P. galatheae Barnard, 1961	P (CAL?)

Family Valettiidae Stebbing, 1888

Valettiopsis dentata Holmes, 1908	P (BC-CAL, deep)
Cedrosella fomes (Barnard, 1967)	P (CAL)?

1. Incerta sedis

Eurystheus grillus Lichtenstein, 1882	P (abyssal)

Superfamily Stegocephaloidea Bousfield, 1979

Family Stegocephalidae Dana, 1855

Subfamily Adanieniexinae Berge, 2000

Andaniexis abyssi Boeck, 1871	P (deep), A-At (AC)
A. elinae Berge & Vader, 1997	A
A. gracilis Berge & Vader, 1997	A
A. lupus Berge & Vader, 1997	A
Parandania boecki (Stebbing, 1888)	P (BC)
Parandaniexis mirabilis Schellenberg, 1929	P (BC?)

Subfamily Andaniopsinae Berge, 2000

Andaniopsis nordlandica (Boeck, 1871)	At (BF)
Andanieopsis pectinata (Sars, 1882)	A-At (NFLD)

Subfamily Stegocephalinae Berge, 2000

Bousfieldia mammilidacta (Moore, 1992)	P (BC)
Gordania camoti (Barnard, 1967)	P (CAL)
Phippsia romeri Schellenberg, 1925	A
Pseudo viscaina (Barnard, 1967)	P (CAL)
Stegocephalexia penelope Moore, 1992	P (BC)
S, hancocki (Hurley, 1956)	P (S CAL, deep)
S. minima (Stephensen, 1925)	A-At (NFLD)
S. pajarella (Barnard, 1967)	P (CAL)
Stegocephalus ampulla (Phipps, 1774)	A
S. abyssicola (Oldevig, 1959)	A
S. inflatus Kroyer, 1842	PA (BER)-A-At (ST L)
S. cascadiensis (Moore, 1992)	P (ORE, deep)
S. similis (Sars, 1895)	A

Superfamily Pardaliscoidea Bousfield, 1979

Family Pardaliscidae Boeck, 1871

Caleidoscopsis tikal (J. L. Barnard, 1967)	P (CAL)
Halice abyssi Boeck, 1871	At (ST L)
H. malygini (Gurjanova, 1936)	A
H. ulcisor Barnard, 1971	P (ORE)
Halicoides lolo (Barnard, 1971)	P (ORE)
H. synopiae (Barnard, 1962)	P (ORE)
H. tambella (Barnard, 1961)	P (CAL)
Pardaliscella symmetrica Barnard, 1959	P (CAL)
P. yaquina Barnard, 1971	P (ORE)
Pardaliscoides fictotelson J. L. Barnard, 1966	P (CAL, deep)
Parahalice mirabilis Birstein & Vinogradov, 1962	P (abyssal)
Rhynohalicella halona (Barnard, 1971)	P (BC-CAL)
Tosilus arroyo Barnard, 1966	P (S CAL, deep)

Family Stilipedidae Holmes, 1908

Subfamily Stilipedinae Holmes, 1908 (revised Holman & Watling, 1983)

Stilipes distincta Holmes, 1908	P (AL-CAL)

Subfamily Astyrinae Pirlot, 1934 (revised Holman & Watling, 1983)

Astyra abyssi Boeck,1871	At (ST L)

Family Vitjazianidae Birstein & Vinogradov, 1955

Vitjaziana gurjanovae Birstein & Vinogradov, 1955	P (BER, deep)

Family Vemanidae Bousfield 1979 (see Thurston, 1989)

Vemana lemuresa Barnard, 1967	P (B CAL, deep)

Superfamily Synopioidea Bousfield, 1979

Family Synopiidae Dana, 1855

Bruzelia tuberculata Sars, 1866	P (AL-CAL), A-At (ST L)
B. inlex Barnard, 1967	P (CAL)
B. guayacura Barnard, 1972	P (CAL?)
B. ascua Barnard 1966	P (CL, deep)
Bruzeliopsis cuspidata Barnard, 1962	P (CAL)
B. turba Barnard, 1964	P (CAL)
Priscosyrrhoe priscis (Barnard, 1967)	P (S CAL)
Garosyrrhoe bigarra (Barnard, 1962)	P (S CAL)
G. cf. *bigarra* (Barnard, 1962)	G (FL)
G. laquei Ortiz, 1985	G (FL - CUBA)
Pseudotiron pervicax Barnard, 1967	P (CAL)
P. golens Barnard, 1962	P (CAL)

P. coas Barnard, 1967	P (CAL)
Synopia ultramarina Dana, 1853	G (FL)
S. scheeleana Bovallius, 1886	G (SE FL)
Syrrhoe crenulata Goes, 1866	P (AL-CAL), A-At (ST L - AC)
S. longifrons Shoemaker, 1964	P (BC-CAL)
S. oluta Barnard, 1972	P (CAL)
Syrrhoites columbiae Barnard, 1972	P (ORE, deep)
S. cohasseta Barnard, 1967	P (CAL)
S. dulcis Barnard, 1967	P (CAL)
S. lorida Barnard, 1962	P (CAL)
S. silex Barnard,1967	P (CAL)
S. terceris Barnard, 1964	P (CAL)
S. trux Barnard, 1967	P (CAL, deep?)
Tiron biocellata Barnard, 1962	P (BC-CAL)
T. spiniferus (Stimpson, 1854)	A-At (AC)
Metatiron cf. bellairsi (Just, 1981)	G (FL)
M. triocellatus (Goeke, 1985)	G (FL)
M. tropakis (Barnard, 1972)	P (CAL?), At (V-C) G (FL?)

Family Argissidae Walker, 1904

Argissa hamatipes (Norman, 1869)	P (BER-CAL), A-At (ST) G (NW FL)

SUBORDER HYPERIIDEA MILNE EDWARDS, 1830

Infraorder Physosomata Pirlot, 1929

Superfamily Scinoidea Bowman & Gruner, 1973

Family Scinidae Stebbing, 1888

Scina borealis (G. O. Sars, 1882)	P (BER-CAL)-At
S. crassicornis (Fabricius, 1775)	P (ORE-CAL)
S. nana Wagler, 1926	P (CAL)
S. rattrayi Stebbing, 1895	P (BC-WA, slope)-At
S. tullbergi (Bovallius, 1885)	P (CAL)-At (G)
Proscina vinogradovi Shih & Hendrycks, 1996	P (AL) (54 40'N 155 10'W)
Cheloscina antennula Shih & Hendrycks, 1996	P (AL) (53 20'N 155 16'W)

Family Mimonectidae Bovallius, 1885

Mimonectes sphaericus Bovallius, 1885	P (BER)-A-At
M. gaussi Woltereck,1904?	P (BC-WA)

Superfamily Lanceoloidea Bowman & Gruner, 1973

Family Lanceolidae Bovallius, 1887

Scypholaneola aestiva Stebbing, 1888	P (WA-CAL, deep)-At
S. vanhoeffeni Woltereck, 1909	P (BC-WA)

Lanceola loveni Bovallius, 1885	P (ORE, deep)-At
L. serrata Bovallius, 1885	P (CAL, deep)
L. pacifica Bowman 1973	P (BC-WA)
L. sayana Bovallius, 1885	P (BER)

Family Chuneolidae Woltereck, 1909

Chuneola parasitica Vinogradov, 1956	P (BER-W ALEUT)

Infraorder Physocephalata Bowman & Gruner, 1973

Superfamily Vibilioidea Bowman & Gruner, 1973

Family Vibiliidae Dana, 1852

Vibilia armata Bovallius, 1887	P (ORE-CAL)
V. australis Stebbing, 1888	P (BC-WA)-At - G
V. viatrix Bovallius, 1887	P (CAL)
V. gibbosa? Bovallius 1887	P (CAL)

Family Cystosomatidae Willemoes-Suhm, 1875

Cyctosoma fabricii Stebbing, 1888	P (BC-CAL)-At, deep
C. pellucidus (Willemoes-Suhm, 1873)	P (SE AL-CAL)-At

Family Paraphronimidae Bovallius, 1887

Paraphronima crassipes Claus, 1879	P (BER-CAL, slope)-At (G)
P. gracilis Claus, 1879	P (BC-WA, deep)-At (Gulf)

Superfamily Phronimoidea Bowman & Gruner, 1973

Family Phronimidae Dana, 1853

Phronima atlantica Guerin, 1836	P (BER-CAL)-At-G
P. bowmani Shih, 1991	P (CAL)
P. dunbari Shih, 1991	P (CAL)
P. pacifica Streets, 1877	At-G
P. sedentaria (Forskal, 1775)	P (BC-CAL)-At
P. solitaria Guerin, 1836	At-G
P. stebbingi Vosseler, 1900	At-G
Phronimella elongata (Claus, 1862)	P (ORE)-At-G

Family Dairellidae Bovallius, 1887

Dairella californica (Bovallius, 1885)	P (ORE-CAL, oceanic)

Family Phrosinidae Dana, 1853 (=Anchylomeridae)

Anchylomera blossevillei Milne-Edwards, 1830	P (WA-CAL)-At-G

Phrosina semilunata Risso, 1822	P (CAL)-At-G
Primno abyssalis (Bowman, 1968)	P (BC-CAL)
P. brevidens Bowman, 1978	G
P. johnsoni Bowman, 1978	At-G
P. lateillei Stebbing, 1888	P (CAL)

Family Hyperiidae Dana, 1852

Hyperia antarctica Spandl, 1927	P (AL-CAL)
H. bengalensis (Giles, 1887?)	P (CAL)
H. galba (Montagu, 1813)	P (BER)-A-At
H. leptura Bowman, 1973	P (CAL)
H. medusarum (O.F.Mueller, 1776)	P (BER-CAL)-A-At
H. spinigera Bovallius, 1889	P (BC-CAL)-At
Hyperietta stephenseni Bowman 1973	P (BC-CAL)-At(G)
H. vosseleri (Stebbing, 1904)	P (CAL)-At (G)
H. luzoni (Stebbing, 1888)	P (CAL)-At-G
H. stebbingi Bowman, 1973	P (CAL)-At -G)
Hyperoche medusarum (Kroyer, 1842)	P-A-At
Hyperioides longipes Chevreux, 1900	P (CAL)-At-G
Hyperionyx macrodactylus (Stephensen, 1924)	At-G
Iulopsis loveni Bovallius, 1887	At
Lestrigonus bengalensis Giles, 1887	At -G
L. schizogeneios (Stebbing, 1888)	P (CAL)-At-G
L. crucipes (Bovallius, 1889)	At-G
L. macrophthalmus (Vosseler, 1901)	At-G
L. latissimus (Bovallius, 1889)	At-G
L. shoemakeri Bowman, 1973	P (S CAL)
Parathemisto abyssorum Boeck, 1870	P (BER)-A-At, deep
Phronimopsis spinifera Claus, 1879	At-G
Themistella fusca (Dana, 1853)	At-G
Themisto pacifica (Stebbing, 1888)	P (BER-CAL)
T. libellula Lichtenstein, 1822	P (BER)-A-At
T. guadichaudii Guerin 1842	A-At

Superfamily Lycaeopsoidea Bowman & Gruner, 1973

Family Lycaeopsidae Chevreux, 1913

Lycaeopsis themistoides Claus, 1879	At-G
L. zamboangae (Stebbing, 1888)	P (CAL)-At

Superfamily Platysceloidea Bowman & Gruner, 1973

Family Pronoidae Claus, 1879

Eupronoe armata Claus, 1879	At-G
E. minuta Claus, 1879	P (CAL)-At-GULF
Paralycaea gracilis Claus, 1879	P (CAL)-At-G
Sympronoe parva (Claus, 1879)	P (S CAL)-At-G

Family Anapronoidae Bowman & Grüner, 1973

Anapronoe reinhardti Stephensen, 1925	P (CAL)

Family Lycaeidae Claus, 1879

Lycaea pulex Marion, 1874	P (CAL)
L. vincenti Stebbing, 1888	At-G
L. bovallioides Stephensen, 1925	G
L. bovallii Chevreux, 1900	G
Brachyscelus crusculum Bate, 1961	P (BC-CAL)-At?
B. globiceps (Claus, 1871)	At (CUBA)?
B. rapax Claus, 1871	G

Family Oxycephalidae Bate, 1861

Oxycephalus clausi Bovallius, 1887	P (BC-CAL, deep)-At-G
O. piscator Milne Edwards, 1830	At-G
Cranoecephalus scleroticus (Streets, 1878)	At-G
Leptocotis tenuirostris (Claus, 1871)	At-G
Rhabdosoma whitei Bate, 1862	At-G
Simorhynchotis antennarius Claus, 1871	G
Streetsia challengeri Stebbing, 1888	P (BC-CAL, slope)-At-G
S. mindanaonis (Stebbing, 1888)	G
S. pronoides (Bovallius,1887)	P (CAL)

Family Platyscelidae Bate, 1862

Amphithyrus bispinosus Claus, 1879	G
A. sculpturatus Claus, 1879	At-G
Hemityphus rapax (Milne-Edwards, 1830)	At-G
Paratyphis maculatus Claus, 1879	At-G
Platyscelus serratulus Stebbing 1888?	P (S CAL)
P. ovoides (Claus, 1879)	At-G
Tetrathyrus forcipatus Claus, 1879	At-G

Family Parascelidae Bovallius, 1887

Thyropus edwardsi (Claus, 1879)	At-G
T. sphaeroma (Claus, 1879)	At-G
T. typhoides (Claus, 1979)	P (CAL)-G
Schizoscelus ornatus Claus, 1879	At-G

Superfamily Phoxocephaloidea Bousfield, 1979 [=Haustorioidea Barnard & Drummon, 1982 (part)]

Family Platyischnopidae Thomas & Barnard, 1983

Eudevenopus honduranus Thomas & Barnard, 1983	At (FL-SC), G
E. metagracilis (Barnard, 1964)	P (S CAL)
Skaptopus brychius Thomas & Barnard, 1983	At (V-C, slope), G
Tiburonella viscana (Barnard, 1969)	P (S CAL)

Family Urothoidae Bousfield, 1979

Urothoe denticulata Gurjanova, 1951	P (BER?)
U. rotundifrons Barnard, 1962	P (CAL)
U. varvarini Gurjanova, 1953	P (BC-CAL)

Family Phoxocephalidae G. O. Sars, 1895

Subfamily Metharpiniinae Jarrett & Bousfield, 1994a

Grandifoxus aciculatus Coyle, 1982	P (AL-BC)
G. acanthinus Coyle, 1982	P (AL)
G. constantinus Jarrett & Bousfield, 1994a	P (BER)
G. dixonensis Jarrett & Bousfield, 1994a	P (BC)
G. grandis (Stimpson, 1856)	P (BC-CAL)
G. lindbergi (Gurjanova, 1953)	P (BER-BC)
G. longirostris (Gurjanova, 1938)	P (BER-BC)
G. nasutus (Gurjanova, 1936)	P (AL)
G. pseudonasutus Jarrett & Bousfield, 1994a	P (ALEUT)
G vulpinus Coyle, 1982	P (AL-BC)
Beringiaphoxus beringianus Jarrett & Bousfield, 1994a	P (BER)
Majoxiphalus major (Barnard, 1960)	P (SE AL-CAL)
M. maximus Jarrett & Bousfield, 1994a	P (AL-BC)
Foxiphalus aleuti (Barnard & Barnard, 1982)	P (AL)
F. apache Barnard & Barnard, 1982	P (S CAL)
F. cognatus (Barnard, 1960)	P (S CAL)
F. falciformis Jarrett & Bousfield, 1994a	P (BC-ORE)
F. fucaximeus Jarrett & Bousfield, 1994a	P (WA)
F. golfensis Barnard & Barnard, 1982	P (S CAL)
F. obtusidens (Alderman 1936)	P (ORE-CAL)
F. secasius Barnard & Barnard, 1982	P (S CAL)
F. similis (Barnard, 1960)	P (BC-CAL)
F. slatteryi Jarrett & Bousfield, 1994a	P (BER)
F. xiximeus Barnard & Barnard, 1982	P (BC-CAL)
Metharpinia coronadoi Barnard 1980	P (S CAL)
M. floridana (Shoemaker, 1933)	P (CAL?), G (FL)
M. jonesi (Barnard, 1963)	P (S CAL)
Rhepoxynius abronius (J. L. Barnard, 1960)	P (BC-CAL)
R. barnardi Jarrett & Bousfield, 1994a	P (BC-CAL)
R. bicuspidatus (Barnard, 1960)	P (BC-CAL)
R. boreovariatus Jarrett & Bousfield, 1994a	P (BC)
R. daboius (Barnard, 1960)	P (BC-CAL)

R.	*fatigans* (Barnard, 1960)	P (BC-CAL)
R.	*gemmatus* (Barnard, 1969)	P (S CAL)
R.	*heterocuspidatus* (Barnard, 1960)	P (S CAL)
R.	*homocuspidatus* (Barnard & Barnard, 1982)	P (S CAL)
R.	*lucubrans* (Barnard, 1960)	P (S CAL)
R.	*menziesi* (Barnard & Barnard, 1982)	P (S CAL)
R.	*pallidus* (Barnard, 1960)	P (BC-CAL)
R.	*stenodes* (Barnard, 1960)	P (S CAL)
R.	*tridentatus* (Barnard, 1954)	P (ORE-CAL)
R.	*variatus* (Barnard, 1960)	P (BC-CAL)
R.	*vigitegus* (Barnard, 1971)	P (BC-ORE)
R.	*epistomus* (Shoemaker, 1938)	At (V-C?) G (FL?)
R.	*hudsoni* Barnard & Barnard, 1982	At (V-C) G (FL?)

Subfamily Pontharpiniinae Barnard & Drummond, 1978

Mandibulophoxus	*alaskensis* Jarrett & Bousfield, 1994b	P (AL-BC)
M.	*gilesi* J. L. Barnard, 1957	P (BC-CAL)
M.	*mayi* Jarrett & Bousfield, 1994b	P (SE AL-BC)

Subfamily Parharpiniinae Barnard & Drummond, 1978

Eyakia robusta (Holmes, 1908)	P (SE AL-CAL)
Eyakia sp. 1 (= *E. robusta* Barnard & Barnard, 1981)	P (CAL)
Eyakia calcarata (Gurjanova, 1938]	P (CAL)

Subfamily Brolginae Barnard & Drummond, 1978

Eobrolgus	*chumashi* Barnard & Barnard, 1981	P (AL-CAL)
E.	*pontarpioides* Gurjanova, 1953	P (BER)
E.	*spinosus* (Holmes,1905)	P?-At(V), G (E FL?)
Paraphoxus	*beringiensis* Jarrett & Bousfield, 1994b	P (BER)
P.	*communis* Jarrett & Bousfield, 1994b	P (BC)
P.	*gracilis* Jarrett & Bousfield, 1994b	P (BC-CAL)
P.	*oculatus* Sars, 1879	At (ST L)
P.	*pacificus* Jarrett & Bousfield, 1994b	P (BER-BC)
P.	*rugosus* Jarrett & Bousfield, 1994b	P (BER)
P.	*similis* Jarrett & Bousfield, 1994b	P (BC)
P.	*simplex* Jarrett & Bousfield, 1994b	P (BER?)

Subfamily Phoxocephalinae Barnard & Drummond, 1978

Cephalophoxoides homilis (Barnard, 1960)	P (BC-CAL)
Leptophoxus icelus Barnard, 1960	P (CAL)
Metaphoxus frequens Barnard, 1960	P (SE AL-CAL)
Parametaphoxus fultoni (in Barnard, 1960 in part)	P (AL-CAL)
Parametophoxus quaylei Jarrett & Bousfield, 1994b	P (BC-ORE)
Phoxocephalus holbolli (Kroyer, 1842)	A-At (AC-CHES)

Subfamily Harpiniinae Barnard & Drummond, 1978

Coxophoxus hidalgo J. L. Barnard, 1966	P (CAL)
Harpinia antennaria Meinert, 1893	AP, At (V, deep slope)
H. clivicola Watling, 1981	At (off DEL)
H. cabotensis Shoemaker, 1930	At (AC)
H. pectinata G.O. Sars, 1891	AP, At (S to Hatteras) (see Watling)
H. plumosa (Kroyer, 1842)	At (St.L)
H. propinqua Sars, 1891	At (AC) C Hat. Watling, 1981
H. serrata Sars, 1879	At, G deep?
H. truncata Sars, 1894	At (to Mid At) (see Watling)
Harpiniopsis fulgens J. L. Barnard, 1960	P (BC-CAL)
H. emeryi Barnard, 1960	P (CAL?)
H. epistomata Barnard, 1960	P (S CAL)
H. fulgens Barnard, 1960	P (CAL)
H. galera Barnard, 1960	P (CAL)
H. gurjanovae Bulycheva, 1936	P (BER)
H. naiadis Barnard, 1960	P (S CAL)
H. percellaris Barnard, 1971	P (ORE, deep)
H. petulans Barnard, 1966	P (CAL)
H. profundis Barnard 1960	P (CAL?)
H. triplex Barnard, 1971	P (ORE, deep)
Heterophoxus affinis (Holmes, 1908)	P (SE AL-CAL)
H. oculatus (Holmes. 1908)	P (S CAL)
H. conlanae Jarrett & Bousfield, 1994b	P (SE AL-ORE)
H. ellisi Jarrett & Bousfield, 1994b	P (BC-ORE)
H. ellisi variant Jarrett & Bousfield ,1994b	P (BC)
H. nitellus Barnard, 1990	P (S. CAL)
Pseudharpinia excavata Chevreux, 1887	P (CAL)
P. inexpectata Jarrett & Bousfield, 1994b	P (BC)
P. sanpedroensis (Barnard, 1960)	P (S CAL)

Superfamily Eusiroidea Bousfield, 1979

Family Amathillopsidae Pirlot, 1934 (transferred to Iphimedioidea by Lowry & Myers, 2000)

Amathillopsis spinigera Heller, 1875	P -At (pelagic)

Family Bateidae Stebbing, 1906

Batea catharinensis Müller, 1865	G (FL)
B. bousfieldi Ortiz, 1991	G (W FL)
B. lobata Shoemaker, 1926	P (S CAL)
B. transversa Shoemaker, 1926	P (S CAL)
Carinobatea cuspidata Shoemaker, 1926	G (W FL)
C. carinata Shoemaker, 1926	G (FL)

Family Eusiridae Stebbing, 1888

Cleonardo moirae Bousfield & Hendrycks, 1995a	P (BC, pelagic)
Eusirella elegans Chevreux, 1908	At (ST L)

E. multicalceola (Thorsteinson, 1941)	P (BC-WA, pelagic)
Eusirogenes deflexifrons Shoemaker, 1930	At (ST L)
Eusiroides monoculoides (Haswell, 1879)	P (CAL)
Eusirus columbianus Bousfield & Hendrycks, 1995a	P (BC)
Eusirus cuspidatus Kroyer, 1845	P, At (ST L)
Eusirus longipes Boeck, 1871	At (ST L, slope)
Eusirus propinquus G. O. Sars, 1893	At (ST L, slope)
Rhachotropis aculeata (Lepechin, 1780)	A-P
R. americana Bousfield & Hendrycks, 1995a	P (BC)
R. barnardi Bousfield & Hendrycks, 1995a	P (CAL)
R. boreopacifica Bousfield & Hendrycks, 1995a	P (SE AL-BC)
R. cervus Barnard, 1957	P (S CAL)
R. clemens Barnard, 1967	P (CAL)
R. conlanae Bousfield & Hendrycks,1995a	P (BC)
R. distincta (Holmes, 1908)	P (pelagic), At (ST L)
R. inflata (Sars, 1883)	P (AL-CAL)At (ST L, slope)
R. ludificor Barnard, 1967	P (CAL)
R. luculenta Barnard, 1969	P (S CAL?)
R. oculata (Hansen, 1888)	At-A-P
R. minuta Bousfield & Hendrycks, 1995a	P (BC)
R. natator (Holmes, 1908)	P (pelagic)
Rozinante fragilis (Goes, 1866)	A-At (ST L)

Family Gammaracanthidae Bousfield, 1977

Gammaracanthus loricatus Sabine, 1824	A-At (AC)
Pseudacanthus aestuariorum (Lomakinia, 1952)	P (AL)-A-At (AC)(Dadswell,1974)

Family Gammarellidae Bousfield, 1977

Gammarellus homari (L., 1768)	A-At (AC)
G. angulosus (Rathke, 1843)	At (AC)

Family Pontogeneiidae Stebbing, 1906

Accedomoera vagor J. L. Barnard, 1969	P (SE AL-CAL)
A. melanopthalma (Gurjanova, 1938)	P (SE AL-CAL)
Nasageneia quinsana (Barnard, 1964)	P (S CAL)
N. yucatenensis Ledoyer, 1986	G (FL)
Paramoera (Paramoera) columbiana Bousfield, 1958	P (SE AL-ORE)
P. (Paramoera) mohri Barnard, 1958	P (CAL-WA)
P. (Paramoera) bousfieldi Staude, 1995	P (SE AL-ORE)
P. (Paramoera) serrata Staude, 1995	P (WA-CAL)
P. (Paramoera) suchaneki Staude, 1995	P (SE AL-S CAL
P. (Rhithromoera) bucki Staude, 1995	P (SE AL-WA)
P. (Rhithromoera) carlottensis Bousfield, 1958	P (SE AL-BC)
P. (Humilomoera) leucophthalma Staude, 1995	P (SE AL-WA)
P. (Humilomoera) crassicauda Staude, 1995	P (AL)
Pontogeneia inermis (Kroyer, 1838)	P (BER-CAL)-A-At
P ivanovi Gurjanova 1951	P (BER-WA)-A
P. rostrata Gurjanova, 1938	P (BER-CAL)-A

P.	*intermedia* Gurjanova,1938	P (BER-CAL)-
P.	*(Tethygeneia) opata* Barnard, 1979	P (CAL)
P.	*(T.) longleyi* Shoemaker, 1933	G (Fl)
P.	*(T.) bartschi* Shoemaker, 1948	G (FL-CUBA)

Family Calliopiidae G. O. Sars, 1895

Apherusa bispinosa (Bate, 1857)		At (GST L)
A.	*cirrhus* (Bate,1862)	A
A.	*fragilis* (Goes, 1966)	A-At (ST L)
A.	*glacialis* Hansen, 1888	A-P
A.	*megalops* (Buchholz, 1874)	A-P (BER)
A.	*retovskii* Gurjanova, 1934	A
A.	*sarsi* Shoemaker, 1930	A
A.	*tridentata* (Bruzelius, 1859)	A
Bouvierella carcinophila Chevreux, 1889		P (BC), At (ST L)
Calliopius behringi Gurjanova, 1951		P (BER)
C.	*columbianus* Bousfield & Hendrycks, 1997	P (SE AL-ORE)
C.	*carinatus* Bousfield & Hendrycks, 1997	P (BC-CAL)
C.	*laeviusculus* (Kroyer, 1838)	A-At-AC)
C.	*pacificus* Bousfield & Hendrycks, 1997	P B(BC-CAL)
C.	*sablensis* Bousfield & Hendrycks, 1997	At (AC)
Cleippides bicuspis Stephenson, 1931		A
C.	*quadricuspis* Heller, 1875	A
Dolobrotus mardeni Bowman 1974		At (AC, deep)
Haliragés bispinosus Stephensen 1916		At (ST L, deep)
H.	*fulvocincta* (M. Sars, 1858)	A (Barrow), At (ST L)
H.	*elegans* Norman, 1882	A
H.	*mixta* Stephenson, 1931	A
H.	*nilssoni* Ohlin, 1895	At-A (G, N, deep)
H.	*quadridentata* Sars, 1876	A
Haliragoides inermis (Sars, 1882)		At-A (ST L)
Laothoes meinerti Boeck, 1871		A
L.	*pacificus* Gurjanova, 1938	PA (BER)
L.	*polylovi Gurj*anova, 1946	At (ST L - LABR, deep)
Leptamphopus paripes Stephensen, 1931		P (BC, deep), At (ST L, slope)
Oligochinus lighti J. L. Barnard, 1969		P (AL-CAL)
Oradarea longimana (Boeck, 1871)		P (BC-CAL), At (ST L, deep)
Paracalliopiella pratti Barnard, 1954		P (BER-CAL)
P.	*beringiensis* Bousfield & Hendrycks, 1997	P-A (BER)
P	*haliragoides* Bousfield & Hendrycks, 1997	P-A (BER)
P.	*kudrjaschovi* Bousfield & Hendrycks, 1997	P-A (BER)
P.	*slatteryi* Bousfield & Hendrycks, 1997	P (BER)
Weyprechtia pinguis (Kroyer, 1838)		A-P-At (ST L-LABR)
W.	*heuglini* (Buchholz, 1874)	A-P-At (ST L)

Superfamily Oedicerotoidea Bousfield, 1979

Family Oedicerotidae Lilljeborg, 1865.

Acanthostepheia behringiensis (Lockington, 1877)		A (BER)
A.	*malmgreni* (Goes, 1866)	P (BER), A-At (ST L, deep)

Aceroides distinguendus (Hansen, 1888)	A (BAR)
A. edax J. L. Barnard, 1967	P (CAL, deep)
A. goesi Just, 1980	A
A. latipes (Sars, 1882)	P (SE AL-BC), A-At (ST L deep)
A. sedovi Gurjanova, 1946	A
Americhelidium americanum (Bousfield, 1973)	G (FL))
A. millsi Bousfield & Chevrier 1996	P (WA)
A. pectinatum Bousfield & Chevrier, 1996	P (BC-ORE)
A. micropleon (Barnard, 1977)	P (S CAL)
A. setosum Bousfield & Chevrier, 1996	P (SE AL-BC)
A. variabilum Bousfield & Chevrier, 1996	P (BC-WA)
A. shoemakeri (Mills, 1962)	P (BER-CAL)
A. rectipalmum (Mills, 1962)	P (BER-CAL)
Ameroculodes edwardsi (Holmes,1903)(Ledoyer, 1972)	At (AC) (not FL!)
A. holmesi Bousfield 1996	At (V) G (FL?)
Arrhinopis longicornis Stappers, 1911	A-At (ST L)
Arrhis lutkeni Gurjanova, 1936	P (AL?)
A. phyllonyx (M. Sars, 1858)	A-At (ST L, slope)
Bathymedon antennarius Just, 1980	A
B. covilhani J. L. Barnard, 1961	P (ORE, deep)
B. flebilis Barnard, 1967	P (ORE-CAL, deep)
B. kassites Barnard, 1966	P (CAL-deep)
B. longimanus (Boeck, 1871)	At (G, N, slope)
B. nanseni Gurjanova, 1946	P (BER-BC)A-At (ST L)
B. pumilis Barnard, 1962	P (ORE-S CAL)
B. obtusifrons (Hansen, 1887)	A-At (ST L)
B. roquedo Barnard, 1962	P (CAL)
B. saussurei (Boeck, 1871)	At (ST L)
B. vulpeculus Barnard, 1971	P (ORE-S CAL, deep)
Deflexilodes enigmaticus Bousfield & Chevrier, 1996.	P (SE AL-BC)
D. intermedius Shoemaker 1930	A-At (AC) (not FL!)
D. norvegicus (Boeck 1871)	P (S CAL), At -(ST L)
D. similis Bousfield & Chevrier, 1996	P (AL-BC)
D. simplex Hansen, 1887	A-At (ST L, slope)
D. tesselatus Schneider, 1884	At (ST L)
D. tuberculatus Boeck, 1871	A-At (ST L, slope)
Finoculodes omnifera Barnard, 1971	P (ORE, deep)
Hartmanodes hartmanae (Barnard, 1962)	P (S. CAL)
H. nyei (Shoemaker, 1933)	G (FL) (see Ortiz, 1979)
Kroyera carinata Bate, 1857	P (BC?)
Machaironyx muelleri Coyle,1980	P (BER)
Monoculodes brevirostris Bousfield & Chevrier, 1996	P (BC)
M. castalskii Gurjanova, 1951	P (BER)
M. diamesus Gurjanova, 1936	P (BER?-BC)
M. demissus Stimpson, 1853	AT (AC)
M. emarginatus J. L.Barnard, 1962	P (ORE-CAL)
M. glyconicus Barnard, 1967	P (CAL, deep)
M. latissimanus (Stephensen, 1931)	P (ORE-BC?), At (ST L)
M. latimanus (Goes, 1861	P (SE AL-WA)-A-At (ST L, slope)
M. longirostris (Goes, 1866)	A-At (N, slope)
M. murrius Barnard, 1962	P (CAL)

M. necopinus Barnard, 1967	P (CAL, deep)
M. packardi Boeck, 1871	A-At (AC)
M. perditus J. L. Barnard, 1966	P (BC-S CAL)
M. recandesco Barnard, 1967	P (ORE, deep)
M. sudor Barnard, 1967	P (Cal, deep)
M. tenuirostratus Boeck, 1871	At (N, slope)
Monoculopsis longicornis (Boeck, 1871)	P (BER)-A-At(AC)
Oediceroides trepadora (Barnard, 1961)	P (ORE-CAL, deep)
Oediceros borealis Boeck, 1871	A-At (AC)
O. saginatus Kroyer, 1842	A-At (G)
Pacifoculodes spinipes (Mills, 1962)	P (BC-ORE)
P bruneli Bousfield & Chevrier 1996	P (SE AL)
P. barnardi Bousfield & Chevrier, 1996	P (CAL)
P. levingsi Bousfield & Chevrier, 1996	P (BC)
P. crassirostris (Hansen, 1887)	P (AL)
P. zernovi (Gurjanova, 1936)	P (BER-BC)
Paroediceros behringiensis Lockington, 1877	P (BER)-A
P. lynceus (M. Sars, 1858)	P (ALEUT), A-At (ST L, slope)
P. propinquus (Goes, 1866)	A-At ST L, slope)
Perioculodes cerasinus Thomas & Barnard, 1985	G (FL-BL)
P. longimanus (Bate & Westwood, 1868)	At (ST L)
Rostroculodes borealis (Boeck, 1871)	P-A (BAR), At-A (G, N)
R. hanseni Stebbing, 1894	A
R. kroyeri (Boeck, 1871)	A-At (ST L, slope)
R. longirostris (Goes, 1866)	P-A (BAR)
R. schneideri (Sars, 1895)	P-A (BAR), A-At (ST L)
R. vibei (Just, 1980)	A-At (LABR)
Synchelidium tenuimanum Norman 1895	At (ST L, shelf)
Westwoodilla brevicalcar (Goes, 1866)	P (BC-CAL), A-At (ST L)
W. megalops (Sars, 1882) (syn with *caecula*?)	A

Superfamily Leucothoidea Bousfield, 1979

Family Leucothoidae Dana, 1852

Anamixis cavitura Thomas, 1997	G (NE)
A. hanseni Stebbing 1899	G (MI)
A. linsleyi Barnard, 1955	P (S CAL)
Leucothoe alata J. L. Barnard, 1959	P (S CAL)
L. spinicarpa (Abildgaard, 1789)	A-At (ST L)
Leucothoides pacifica Barnard, 1955	P (S CAL)
L. pottsi Shoemaker, 1933	G (FL)
(=*Anamixis linsleyi* J. L. Barnard, 1955	

Family Pleustidae Buchholz, 1874

Subfamily Pleustinae Bousfield & Hendrycks, 1994a

Pleustes (Pleustes) panoplus (Kroyer, 1838)	At (A-AC)
Pleustes (Pleustes) panoplus var 4 Bousfield & Hendycks, 1994b	P (BER)-A
Pleustes (P.) panoplus var. 5 Bousf. & Hendrycks, 1994b	P (BER)

Pleustes (P.) tuberculatus (Bate, 1858)	P (BER)
Pleustes (Catapleustes) victoriae Bousfield. & Hendrycks, 1994b	P (BC)
P. (C.) constantinus Bousfield & Hendrycks, 1994b	P (BER)
P. (C.) constantinus var., Bousf. & Hendrycks. 1994b	P (BC)
Thorlaksonius amchitkanus Bousfield & Hendrycks, 1994b	P (BER)
T. borealis Bousfield & Hendrycks, 1994b	P (SE AL-ORE)
T. depressus (Alderman, 1936)	P (ORE-CAL)
T platypus (Barnard & Given, 1960)	P (CAL)
T. brevirostris Bousfield & Hendrycks, 1994b	P (SE AL-CAL)
T. subcarinatus Bousfield & Hendrycks, 1994b	P (SE AL-ORE)
T. grandirostris Bousfield & Hendrycks, 1994b	P (BC-CAL)
Thorlaksonius carinatus Bousfield & Hendrycks, 1994b	P (SE AL-BC)
T. truncatus Bousfield & Hendrycks, 1994b	P (BC)

Subfamily Mesopleustinae Bousfield & Hendrycks, 1994a

Mesopleustes abyssorum (Stebbing, 1888)	P (ORE deep)

Subfamily Pleustoidinae Bousfield & Hendrycks, 1994a

Pleustoides carinatus (Gurjanova, 1972)	P (BER?)

Subfamily Atylopsinae Bousfield & Hendrycks, 1994a, emend Cadien & Martin, 1999

Myzotarsa anixiphilius Cadien & Martin, 1999	P (S CAL)

Subfamily Eosymtinae Bousfield & Hendrycks, 1994a

Eosymytes minutus Bousfield & Hendrycks, 1994a	P (BC)

Subfamily Stenopleustinae Bousfield & Hendrycks, 1994a

Arctopleustes glabricauda (Dunbar, 1954)	A-At (UNG)
Stenopleustes gracilis (Holmes, 1905)	At (AC-DEL) G (FL?)
S. inermis Shoemaker, 1949	At (AC-DEL)
S. latipes M. Sars, 1858)	At (ST L, slope)
Sympleustes olricki Hansen, 1887	A

Subfamily Pleusymtinae Bousfield & Hendrycks, 1994a

Pleusymtes coquillus Barnard, 1971	P (ORE-CAL)
P. glaber (Boeck, 1861)?	P (CAL), A-At (AC)
P. glabroides (Dunbar, 1954)	A-At (LABR)
P. pulchella (G. O. Sars ,1876)	A-At (AC?)
P. subglaber (Boeck, 1871)	P (CAL)
Pleustomesus medius (Goes, 1866)	P?, A-At (ST L, slope)

Subfamily Pleusirinae Bousfield & Hendrycks, 1994a

Pleusirus secorrus Barnard, 1969	P (AL-CAL)

Subfamily Dactylopleustinae Bousfield & Hendrycks, 1994a

Dactylopleustes echinoides Bousf. & Hendrycks, 1995b	P (BC-CAL)

Subfamily Neopleustinae Bousfield & Hendrycks, 1994a

Neopleustes pulchellus (Kroyer, 1846)	At-A (ST L, slope)
"Parapleustes" bicuspis (Kroyer, 1838)	A-At
"P. " assimilis (Sars, 1895)	A-At
"P." gracilis Buchholz, 1874	At (G)
Pleustostenus displosus Gurjanova, 1972	P (BER?)
"Sympleustes" cornigerus Shoemaker, 1964	P-A (BAR)

Subfamily Parapleustinae Bousfield & Hendrycks, 1994a

Chromopleustes johanseni Bousfield & Hendrycks, 1995ab	P (BER)
C. oculatus (Holmes, 1908) .	P (AL-CAL)
C. lineatus Bousfield & Hendrycks, 1995ab	P (SE AL- N CAL)
Incisocalliope aestuarius (Watling & Maurer, 1973)	At (V); G (FL?)
I. karstensi J. L. Barnard, 1959 .	A
Micropleustes nautilus (Barnard, 1969)	P (AL-CAL)
M. nautiloides Bousfield & Hendrycks, 1995b	P (BC-CAL)
Parapleustes americanus Bousfleld & Hendrycks, 1995b	P (AL-BC)
Gnathopleustes pugettensi (Dana, 1853)	P (SE AL-CAL)
G. serratus Bousfield & Hendrycks, 1995b	P (SE AL-CAL)
G. pachychaetus Bousfield & Hendrycks, 1995b	P (SE AL-ORE)
G. trichodus Bousfield & Hendrycks, 1995b	P (BC)
G. simplex Bousfield & Hendrycks, 1995b	P (BC)
G. den (Barnard, 1969)	P (CAL)
Trachypleustes trevori Bousfield & Hendrycks, 1995b .	P (AL-BC)
T. vancouverensis Bousfield & Hendrycks, 1995b	P (BC)
Commensipleustes commensalis (Shoemaker, 1952)	P (CAL)
Incisocalliope aestuarius (Watling & Maurer, 1973)	G (FL?)
I. newportensis Barnard, 1959	P (S CAL)
I. bairdi (Boeck, 1871)	P (S CAL)
I. makiki (Barnard, 1970)	P (HAW)

Superfamily Stenothoidea Bousfield (2001)

Family Amphilochidae Boeck, 1871

Subfamily Amphilochinae Barnard & Karaman, 1991

Amphilochoides odontonyx (Boeck, 1871)	A-At (shelf)
Apolochus barnardi Hoover & Bousfield, 2001	P (CAL)
A. casahoya (McKinney, 1978)	G (FL-TEX)
A. delacaya (McKinney, 1978)	G.
A. litoralis (Stout, 1912)	P (SE AL-CAL)
A. manudens (Bate, 1862)	At (ST L)
A. picadurus (Barnard, 1962)	P (CAL)
A. staudei (Hoover & Bousfield, 2001)	P (BC-WA)

A. pillai Barnard & Thomas, 1983	G (FL)
A. tenuimanus Boeck, 1871	A-At (ST L, slope)
Gitana abyssicola Sars, 1892	A-At (ST L, deep)
G. calitemplado Barnard, 1962	P (CAL)
G. ellisi Hoover & Bousfield, 2001	P (BC)
Gitanopsis arctica Sars, 1892	A-At ST L)
G. bispinosa (Boeck, 1871)	A-At (ST L)
G. inermis (Sars, 1882)	A-At (ST L, slope)
Hourstonius vilordes (Barnard, 1962)	P (SE AL-CAL)
H. laguna (McKinney, 1978)	G (FL-TEX)
H. tortugae (Shoemaker, 1933)	G (FL)

Subfamily Cyproideiinae Barnard & Karman, 1991

Haplopheonoides obesa Shoemaker, 1956	G (FL)

Family Stenothoidae Boeck, 1871

Mesometopa esmarki (Boeck, 1871)	P (CAL)
M. neglecta Barnard, 1966	P (CAL)
M. sinuata Shoemaker, 1964	P (ORE-CAL)
Metopa alderi (Bate ,1857)	A-At
M. abyssalis Stephensen, 1931.	A (G-EM)
M. boecki Sars, 1892	A-At
M. borealis Sars, 1882	A-At
M. bruzelii (Goes, 1866)	A-At (ST L)
M. cistella Barnard, 1969	P (CAL)
M. clypeata (Kroyer, 1842)	A-At
M. dawsoni Barnard, 1962	P (CAL)
M. glacialis (Kroyer, 1842)	P (BER), A-At (ST L)
M. groenlandica (Hansen, 1887)	A-At (ST L)
M. invalida G. O. Sars, 1892	At (ST L)
M. leptocarpa G. O. Sars, 1882	A-At (ST L)
M. longicornis Boeck, 1870	A-At (ST L)
M. norvegica (Lilj, 1950?)	At ST L)
M. propinqua G. O. Sars, 1892	A-At (ST L)
M. pusilla G. O. Sars 1892	At (ST L)
M. robusta Sars, 1892	A-At (ST L)
M. samsiluna Barnard, 1962	P (CAL)
M. sinuata Sars, 1892	A-At-(ST L)
M. solsbergi Schneider, 1884	At (ST L)
M. spinicoxa Shoemaker, 1955	A (AC)
M. spitzbergensis Brüggen, 1909	A-At (St L)
M. sporpis Barnard, 1969	P (CAL, deep)
M. tenuimana Sars, 1892	A-At (ST L)
Metopella aporpis Barnard, 1962	P (CAL)
M. carinata (Hansen,1887)	A-At
M. longimana (Boeck 1871)	A-At
M. nasuta (Boeck, 1871)	A-At
Metopelloides micropalpa (Shoemaker, 1930)	At (AC)

M. tattersalli Gurjanova, 1938	A (BAR)
Parametopa alaskensis Holmes, 1904)	P (AL)
P. crassicornis Just, 1980	A-At (ST L)
Parametopella cypris (Holmes 1905)	At (V-C) G (W FL)
P. inquilina Watling, 1976	At (C-V) G (FL)
P. ninis Barnard, 1962	P (CAL)
P. texensis McKinney et al, 1978	G (W FL)
P. cf. *texensis* McKinney, Kalke & Holland, 1978	G (FL)
Proboloides holmesi Bousfield, 1973	At (V)
P. nordmanni (Stephensen, 1931)	A-At
P. pacifica (Holmes, 1908)	P (CAL, deep)
P. tunda Barnard, 1962	P (CAL)
Raumajara carinata (Shoemaker, 1955)	P, A (BAR)
Stenothoe alaskensis Holmes, 1904	P (BER)
S. brevicornis Sars, 1882	A-G?
S. estacola Barnard, 1962	P (CAL)
S. frecanda Barnard, 1962	P (CAL)
S. georgiana Bynum & Fox, 1977	At (C); G (FL)
*S. gallensis Walke*r, 1904	G (FL)
S. marina Bate, 1857	P (CAL?) - At?
S. minuta Holmes, 1905	G (FL)
S. monoculoides Montagu, 1815	At (ST L)
S. symbiotica Shoemaker, 1956	G (FL)
S. valida Dana, 1852	P (CAL)
Stenothoides bicoma Barnard, 1962	P (CAL)
S. burbancki Barnard, 1969	P (CAL)
Stenula incola Barnard, 1969	P (CAL)
S. modosa Barnard, 1962	P (CAL)
S. nordmanni (Stephensen, 1931)	P (BAR), A-At (ST L)
S. peltata (S. I. Smith, 1874)	A-At (ST L, slope)
Zaikometopa erythrophthalmus (Coyle & Mueller, 1981)	P (AL)

Superfamily Iphimedioidea Lowry & Myers, 2000

Family Epimeriidae Boeck, 1871 (=Paramphithoidae Sars, 1895)

Epimeria cora Barnard, 1971	P (deep)
E. longispinosa K.H. Barnard, 1916	At (E FL deep)
E. loricata G.O Sars, 1879	A-At (G-BF)
E. obtusa Watling, 1981	At (C -E FL)
E. yaquinae McCain, 1971	P (ORE, deep)
Paramphithoe hystrix Ross, 1835	P-A-At (G, N,slope)
P. polyacantha (Murdoch, 1885)	A
Ushakoviella echinophora Gurjanova, 1955	P (BER-SE AL)

Family Iphimedidae Boeck, 1871

Acanthonotozoma inflatum (Kroyer,1842)	A-At
A. monodentatus Kudrjaschov, 1965	P (BER?)
A. rusanovae Bryazhgin, 1974	P (BC-AL), At (ST L)

Acanthonotozoma serratum (Fabricius, 1780)	A-At (ST L)
A. sinuatum Just, 1978	A-At (ST L)
Coboldus hedgpethi (Barnard, 1969)	P (CAL)
Curidia debrogania Thomas, 1983	G (FL)
Iphimedia rickettsi Shoemaker, 1931	P (AL)
I. zora Thomas & Barnard, 1991	G (FL)

Family Odiidae Coleman & Barnard, 1991

Cryptodius kelleri (Bruggen, 1907)	P (BC-CAL)
C. unguidactylus Moore, 1992	P (BC)
Imbrexodius oclairi Moore, 1992	P (BC)

Incerta sedis

Family Lafystiidae Sars, 1895

Lafystius acuminatus Bousfield, 1987	AT (V), G (FL?)
L. frameae Bousfield, 1987	AT (V), G (FL?)
L. morrhuana Bousfield, 1987	A-At (AC)
L. sturionis Kroyer, 1842	A-At (AC)
Paralafystius mcallisteri Bousfield, 1987	P (SE AL-BC)
Protolafystius madillae Bousfield, 1987	P (BC)

Superfamily Dexaminoidea Bousfield, 1979

Family Atylidae G. O. Sars, 1882

Subfamily Atylinae Boeck, 1871; revised Bousfield & Kendall 1994

Atylus carinatus (Fabricius, 1793)	P (BER)-A-At (ST L)
A. atlassovi (Gurjanova, 1951)	P (BER)-A
A. borealis Bousfield & Kendall, 1994	P (SE AL-WA)
A. bruggeni (Gurjanova, 1938)	P (BER)-A
A. collingi (Gurjanova, 1938)	P (BER)-A
A. georgianus Bousfield & Kendall, 1994	P (BC-ORE)
A. melanops (Oldevig, 1959)	A
A. nordlandicus Boeck, 1871	A
A. rylovi (Bulycheva, 1952)	P (W PAC)
A. tridens (Alderman, 1936)	P (BC-CAL)

Subfamily Nototropinae Bousfield & Kendall, 1994

Aberratylus aberrantis (J. L. Barnard, 1962)	P (CAL?, deep)
Nototropis minikoi (Walker, 1905)	At (V-C), G (E Fl?)
N. smithi Goes, 1866	A, At ?
N. swammerdamii (Milne-Edwards,1830)	AT (AC-V), G?
N. urocarinatus McKinney, 1980	G (FL-TEX)

Subfamily Lepechinellinae Schellenberg, revised Barnard & Karaman 1991

Lepechinella bieri Barnard, 1957	P (CAL, deep)

Subfamily Anatylinae Bulycheva, 1955; revised Bousfield & Kendall, 1994

Kamehatylus nani Barnard, 1970	P (HAW)

Family Dexaminidae Leach, 1813/14

Subfamily Polycheriinae Bousfield & Kendall, 1994

Polycheria osborni Calman, 1898	P (SE AL-CAL)
P. carinata Bousfield & Kendall, 1994	P (BC)
P. mixillae Bousfield & Kendall, 1994	P (BC)

Subfamily Prophliantinae Nicholls, 1939

Guernea nordenskioldii (Hansen, 1887)	A-At (AC)
G. reduncans (Barnard, 1958)	P (BC-CAL)

Subfamily Dexamininae Leach, 1813/14; revised Bousfield & Kendall, 1994

Dexamine thea Boeck, 1861	At (AC)

Superfamily Ampeliscoidea Bousfield, 1979

Family Ampeliscidae Costa, 1857

Ampelisca abdita Mills,1964	At (ST L, V-C), G (?)
A. aequicornis Bruzelius,1859	At-A (AC)
A. agassizi (Judd, 1896A) (= *A. vera* Barnard, 1954)	P (CAL)-At (V), G (E-FL)
A. amblyops Sars, 1891	At (FL, deep)
A. amblyopsoides J. L. Barnard, 1960	P (CAL)
A. bicarinata Goeke & Heard, 1983	G (FL-MI)
A. birulai Brüggen, 1909	P (BER), A
A. brachycladus Roney, 1990	P (CAL?)
A. brevisimulata Barnard, 1954	P (ORE-BC)
A. burkei Barnard & Thomas, 1989	G (FL)
A. careyi Dickinson, 1982	P (BC-ORE)
A. ciego Barnard, 1966	P (CAL)
A. coeca Holmes, 1908	P (S CAL)
A. cristata Holmes, 1908	P (BC-ORE)
A. cristoides Barnard, 1954	P (S CAL)
A. declivitatus Mills, 1967	At (deep) (ST L)
A. eoa Gurjanova, 1951	P (BER)
A. erythrorhabdota Coyle & Highsmith, 1989	P (BER)
A. eschrichti Kroyer, 1842	P (BER?)-A-At (ST L)
A. fageri Dickinson, 1982 (= *A. schellenbergi* Shoemaker, 1933	P (ORE)
A. furcigera Gurjanova, 1936	P (BER)
A. gibba Sars, 1882	At (ACdeep)
A. hancocki Barnard, 1954	P (BC-ORE)
A. hessleri Dickinson, 1982	P (ORE)
A. holmesi Pearse, 1908	G (FL-MI

A.	*indentata* Barnard, 1954	P (CAL)
A.	*latipes* Stephensen, 1925	At (ST L-AC)
A.	*lobata* Holmes, 1908	P (AL)
	(= *A. articulata* Stout, 1913)	
A.	*macrocephala* Liljeborg, 1852	P (BER)-A-At (AC)
A.	*mexicana* Barnard, 1954	P (S CAL)
A.	*milleri* Barnard, 1954	P (CAL)
A.	*pacifica* Holmes, 1908	P (CAL)
A.	*plumosa* Holmes, 1908	P (AL)
A.	*pugetica* Stimpson, 1864	P (BC-WA)
A.	*romigi* Barnard, 1954	P (CAL)
A	*schellenbergi* (see Coyle & Highsmith, 1989)	P (BER)
A.	*shoemakeri* Barnard, 1954	P (CAL)
A.	*typica* (Bate, 1856)	AT (AC)
A.	*uncinata* Chevreux, 1887	At (AC, deep)
A.	*unsocolae* Barnard, 1960	P (ORE)
A.	*vadorum* Mills, 1963	At (G, V)(E FL?)
A.	*venetiensis* Shoemaker, 1916	P (CAL)
A.	*verrilli* Mills, 1967	At (V-C?)(E FL?)
Byblis	*barbarensis* Barnard, 1960	P (CAL)
B.	*bathyalis* Barnard, 1966	P (CAL)
B.	*brevirama* Dickinson, 1983	P (ORE),- A
B.	*crassicornis* Metzger, 1875	P (BER?)
B.	*frigidis* Coyle & Highsmith, 1989	P (BER)
B.	*gaimardii* (Kroyer, 1846)?	P (BER?)-A-At (AC)
B.	*longispina* Dickinson, 1983	P (BC)
B.	*medialis* Mills, 1971	At (AC, deep)
B.	*millsi* Dickinson, 1983	P (BC)
B.	*mulleni* Dickinson, 1983	P (ORE)
B.	*pearcyi* Dickinson. 1983	P (BER),- A
B.	*robustus* Coyle & Highsmith, 1989	P (BER)
B.	*serrata* S. I. Smith, 1873	At (V), G (E FL?)
B.	*tannerensis* Barnard, 1966	P (CAL)
B.	*teres* (see C. & H., 1989)	P (BER)
B.	*thyabilis* Barnard, 1971	P (ORE)
B.	*veleronis* Barnard, 1954	P (BC-CAL)
Haploops	*fundiensis* Wildish & Dickinson, 1982	At (AC)
H.	*laevis* Hoek, 1882	P (CAL)-A-At (ST L)
H.	*sibirica* Gurjanova, 1929	A
H.	*lodo* Barnard, 1961	P (CAL?)
H.	*setosa* Boeck, 1871	P (ER), At (AC)
H.	*similis* Stephensen, 1925	At (AC, shelf to deep)
H.	*spinosa* Shoemaker, 1931	At (AC)
H.	*tubicola* Liljeborg, 1856	P (BER)-A-At (ST L)

Superfamily Melphidippoidea Bousfield, 1979 [= cheirocratids Barnard & Barnard, 1983 (part)]

Family Melphidippidae Stebbing, 1899

Casco bigelowi (Blake, 1929)	At (ST L-AC-DEL)
Melphisana bola Barnard, 1962	P (AL-CAL)
Melphidipella macer (Norman, 1869)	P (BC)
Melphidippa amorita Barnard, 1966	P (CAL)?
M. borealis Boeck, 1971	P -A?-At (ST L)
M. goesi Stebbing, 1899	A-At (AC)
M. macrura G. O. Sars, 1894	At (ST L)

Family Hornelliidae Bousfield, 1982

*Hornellia (Metaceradocus) tequestae*Thomas & Barnard, 1986	G (FL)
H. occidentalis (Barnard, 1959)	P (S CAL)

Family Megaluropidae Thomas & Barnard, 1986

Megaluropus longimerus Schellenberg, 1925?	P (BC-CAL)
Gibberosus devaneyi Thomas & Barnard, 1986	P (S CAL?)
G. *myersi* (McKinney, 1980)	P (CAL?); G (FL-TEX)
G. visendus (Barnard, 1969)	P (B CAL)
Resupinus coloni Thomas & Barnard, 1986	P (CAL)

Superfamily Liljeborgioidea, Bousfield, 1979

Family Liljeborgiidae Stebbing, 1899

Idunella aequicornis (Sars, 1876)	A-At (ST L)
I. bowenae Karaman, 1979	At (V, shelf)
I. smithi Lazo-Wasem, 1985	At (V), G (E FL?))
Liljeborgia bousfieldi McKinney, 1979	G (FL-TEX)
L. *cota* Barnard, 1962	P (ORE-CAL, deep)
L. fissicornis M. Sars, 1858?)	A-At (N, slope)
L. geminata Barnard, 1969	P (CAL?)
L. pallida (Bate, 1857)	P (CAL)? G (FL)
Listriella albina Barnard, 1959	P (ORE-CAL, deep)
L. barnardi Wigley, 1966	At (V-C), G (W FL)
L. *carinata* McKinney, 1979	G (FL-TEX)
L. clymenellae Mills, 1962	At (V-C), G (FL?)
L. diffusa Barnard, 1959	P (CAL)
L. eriopisa Barnard, 1959	P (S CAL)
L. goleta Barnard, 1959	P (ORE-CAL)
L. melanica Barnard, 1959	P (CAL)
L. quintana McKinney, 1979	G (TEX)

Family Sebidae Walker, 1908

Subfamily Sebinae Holsinger1980

Seba aloe Karaman, 1971	G (W FL)
S. profunda Shaw, 1989	P (BC, deep)

Subfamily Seborgiinae Karaman, 1992

Relictoseborgia hershleri (Holsinger, 1992b)		FW (TEX)
?*R.*	*relicta* (Holsinger, 1980)	FW (TEX)

Family Colomastigidae Stebbing, 1899

Colomastix bousfieldi	LeCroy 1995	G (FL-TEX)
C..	*camura* LeCroy, 1995	At (C), G (FL-TEX)
C.	*cornuticauda* LeCroy, 1995	G (W FLA)
C.	*denticornis* LeCroy,1995	G (W FL)
C.	*falcirama* LeCroy, 1995	G (FL)
C.	*gibbosa* LeCroy, 1995	G (FL)
C.	*halichondriae* Bousfield, 1973	At, G (FL-TEX)
C.	*heardi* LeCroy, 1995	AT (C), G (FL-YUC)
C.	*irciniae* LeCroy, 1995	G (FL)
C.	*janiceae* Heard & Perlmutter, 1977	G (FL-YUC), At (C)
C.	*tridentata* LeCroy, 1995	At (C), G (FL-YUC)

Superfamily Crangonyctoidea Bousfield 1973 [= crangonyctoids Barnard & Barnard, 1983 (part)]

Family Crangonyctidae Bousfield 1973 (revised Holsinger 1977)

Bactrurus brachycaudus Hubricht & Mackin,1940		FW
B.	*hubrichti* Shoemaker, 1945	FW
B.	*mucronatus* (Forbes, 1876)	FW
Crangonyx aberrans D. Smith, 1983		FW
C.	*alpinus* Bousfield, 1963	FW (P)
C.	*anomalus* Hubricht, 1943	FW
C.	*antennatus* Packard, 1881	FW
C.	*dearolfi* Shoemaker, 1942	FW
C.	*floridanus* Bousfield, 1963	FW
C.	*forbesi* (Hubricht & Mackin, 1940)	FW
C.	*gracilis* Smith, 1871	FW
C.	*grandimanus* Bousfield, 1963	FW
C.	*hobbsi* Shoemaker, 1941	FW
C.	*minor* Bousfield, 1958	FW
C.	*obliquus* (Hubricht & Mackin, 1940)	FW
C.	*packardi* S. I. Smith, 1888	FW
C.	*pseudogracilis* Bousfield, 1958	FW
C.	*richmondensis richmondensis* Ellis, 1940	FW
C.	*r. occidentalis* Hubricht & Harrison, 1941	FW (P)
C	*r. laurentianus* Bousfield, 1958	FW
C	*rivularis* Bousfield, 1958	FW
C.	*serratus* (Embody, 1911)	FW
C.	*setodactylus* Bousfield, 1958	FW
C.	*shoemakeri* (Hubricht & Mackin, 1940)	FW
Stygonyx courtneyi Bousfield & Holsinger,1989		FW (P)
Stygobromus abditus Holsinger, 1978		FW
S.	*ackerlyi* Holsinger, 1978	FW
S.	*alabamensis alabamensis* (Stout, 1911)	FW

S.	*a. occidentalis* (Holsinger, 1967)	FW
S.	*allegheniensis* (Holsinger, 1967)	FW
S.	*araeus* (Holsinger, 1969)	FW
S.	*arizonensis* Holsinger, 1974	FW
S.	*balconis* (Hubricht, 1943)	FW
S.	*baroodyi* Holsinger, 1978	FW
S.	*barri* (Holsinger, 1967)	FW
S.	*barryi* Holsinger, 1978	FW
S.	*bifurcatus* (Holsinger, 1967)	FW
S.	*biggersi* Holsinger, 1978	FW
S.	*borealis* Holsinger, 1978	FW
S.	*bowmani* (Holsinger, 1967)	FW
S.	*canadensis* Holsinger, 1980	FW
S.	*carolinensis* Holsinger, 1978	FW
S.	*clantoni* (Creaser, 1934)	FW
S.	*coloradensis* Ward, 1977	FW
S.	*conradi* (Holsinger, 1967)	FW
S.	*cooperi* (Holsinger, 1967)	FW
S.	*cumberlandus* Holsinger, 1978	FW
S.	*dejectus* (Holsinger, 1967)	FW
S.	*dicksoni* Holsinger, 1978	FW
S.	*elatus* (Holsinger, 1967)	FW
S.	*elliotti* Holsinger, 1974	FW
S.	*emarginatus* (Hubricht, 1943)	FW
S.	*ephemerus* (Holsinger, 1969)	FW
S.	*estesi* Holsinger, 1978	FW
S.	*exilis* Hubricht, 1943	FW
S.	*fecundus* Holsinger, 1978	FW
S.	*ferausoni* Holsinger, 1978	FW
S.	*finleyi* Holsinger, 1978	FW
S.	*flagellatus* (Benedict, 1896)	FW
S.	*franzi* Holsinger, 1978	FW
S.	*gracilipes* (Holsinger, 1967)	FW
S.	*gradyi* Holsinger, 1974	FW
S.	*grahami* Holsinger, 1974	FW
S.	*grandis* Holsinger, 1978	FW
S.	*hadenoecus* (Holsinger, 1966)	FW
S.	*harai* Holsinger, 1974	FW
S.	*hayi* (Hubricht & Mackin, 1940)	FW
S.	*heteropodus* Hubricht, 1943	FW
S.	*hoffmani* Holsinger, 1978	FW
S.	*holsingeri* Ward, 1977	FW
S.	*hubbsi* Shoemaker, 1942	FW
S.	*indentatus* (Holsinger, 1967)	FW
S.	*inexpectatus* Holsinger, 1978	FW
S.	*interitus* Holsinger, 1978	FW
S.	*iowae* Hubricht, 1943	FW
S.	*kenki* Holsinger, 1978	FW
S.	*lacicolus* Holsinger, 1974	FW
S.	*leensis* Holsinger, 1978	FW
S.	*longipes* (Holsinger, 1966)	FW

S.	*lucifugus* (Hay, 1882)	FW
S.	*mackenziei* Holsinger, 1974	FW
S.	*mackini* Hubricht, 1943	FW
S.	*minutus* Holsinger, 1978	FW
S.	*montanensis* Holsinger, 1974	FW
S	*montanus* (Holsinger, 1967)	FW
S.	*morrisoni* (Holsinger, 1967)	FW
S.	*mundus* (Holsinger, 1967)	FW
S.	*mysticus* Holsinger, 1974	FW
S.	*nanus* Holsinger, 1978	FW
S.	*nortoni* (Holsinger, 1969)	FW
S.	*obrutus* Holsinger, 1978	FW
S.	*obscurus* Holsinger, 1974	FW
S.	*onondagaensis* (Hubricht & Mackin, 1940)	FW
S	*oregonensis* Holsinger, 1974	FW
S.	*ozarkensis* (Holsinger, 1967)	FW
S.	*parvus* (Holsinger, 1969)	FW
S.	*pecki* (Holsinger, 1967)	FW
S.	*pennaki* Ward, 1977	FW
S.	*phreaticus* Holsinger, 1978	FW
S.	*pizzinii* (Shoemaker, 1938)	FW
S.	*pollostus* Holsinger, 1978	FW
S .	*pseudospinosus* Holsinger, 1978	FW
S.	*putealis* (Holmes, 1909)	FW
S.	*puteanus* Holsinger, 1974	FW
S.	*quatsinensis* Holsinger & Shaw, 1987	FW
S.	*redactus* Holsinger, 1978	FW
S.	*reddelli* (Holsinger, 1966)	FW
S.	*russelli* (Holsinger, 1967)	FW
S.	*secundus* Bousfield & Holsinger, 1981	FW
S.	*sheldoni* Holsinger, 1974	FW
S.	*sierrensis* Holsinger, 1974	FW
S.	*mithi* Hubricht, 1943	FW
S.	*sparsus* Holsinger, 1978 (1969?)	FW
S.	*spinatus* (Holsinger, 1967)	FW
S.	*spinosus* (Hubricht & Mackin, 1940)	FW
S.	*stegerorum* Holsinger, 1978	FW
S.	*stellmacki* (Holsinger, 1967)	FW
S.	*subtilis* (Hubricht, 1943)	FW
S.	*tahoensis* Holsinger, 1974	FW
S.	*tenuis tenuis* (S. I. Smith, 1874)	FW
S.	*t. potomacus* (Holsinger, 1967)	FW
S.	*tritus* Holsinger, 1974	FW
S.	*vitreus* Cope, 1872	FW
S	*wengerorum* Holsinger, 1974	FW
Synpleonia pizzini Shoemaker, 1941		FW (At)
Synurella chamberlaini Shoemaker,1936?		FW (At - FL)
S.	*bifurca* (Hay, 1882)	FW
S.	*chamberlaini* (Ellis, 1941)	FW
S.	*dentata* Hubricht, 1943	FW
S.	*johanseni* Shoemaker, 1920	FW (P)

Superfamily Talitroidea Bulycheva, 1957

Family Hyalidae Bulycheva, 1957

Apohyale pugettensis (Dana, 1853)	P (SE AL-CAL)
A. anceps (Barnard, 1969)	P (CAL-BC)
A. californica (Barnard, 1969)	P (BC-CAL)
Hyale media (Dana, 1853)	G (FL)
H. nilssoni Rathke 1843	At (AC)
H. oculata Bousfield, 1981	P (BC)
H. perieri (Lucas, 1846)	G (FL)
Leptohyale longipalpa Bousfield 1981	P (BC)
Parallorchestes ochotensis (Brandt, 1851)	P (AL-BC)
P. brevicornis Bousfield, 1981	P (AL-BC)
P. minor Bousfield, 1981	P (BC)
P. spinosa Bousfield, 1981	P (BC)?
P. subcarinata Bousfield, 1981	P (SE AL-WA)
P. supracarinata Bousfield, 1981	P (BER)
P. trispinosa Bousfield, 1981	P (BC)
P. nuda Bousfield, 1981	P (BC)
P. americana Bousfield, 1981	P (AL)
P. minima Bousfield, 1981	P (BC)
P. occidentalis Bousfield, 1981	P (BC)
P. subcarinata Bousfield, 1981	P (SE AL-WA)C
Parhyale hawaiensis (Dana,1853)	G (FL)
P. fascigera Stebbing, 1897	G (FL)
Plumulohyale plumulosa (Stimpson, 1857)	P (BC-CAL), At (V), G (FL?)
Protohyale frequens (Stout, 1913)	P (BC-CAL)
P. canalina Barnard, 1979	P (S CAL?)
P. nigra (Haswell, 1879)	P (CAL)
P. lagunae (Stout, 1913)	P (S CAL)
P. intermedia (Bousfield, 1981)	P (SE AL-ORE)
P. seticornis (Bousfield, 1981)	P (SE AL-CAL)
P. oclairi (Bousfield, 1981)	P (SE AL-WA)
P. spinosa (Bousfield, 1981)	P (SE AL-BC)

Family Hyalellidae Bulycheva, 1957

Subfamily Hyalellinae Bousfield, 1996

Allorchestes angusta Dana, 1853	P (AL-CAL)
A. bella bella Barnard, 1974	P (BER-CAL)
A.. pacifica Bousfield, 1981	P (BC)
A. parva Bousfield, 1981	P (BC)
A. subcarinata Bousfield, 1981	P (AL)
A. urocarinata Bousfield, 1981	P (SE AL-BC)
A. carinata Iwasa, 1939 (Bousfield, 1981)	P (BER)
Hyalella (Hyalella) azteca (Saussure, 1858)	FW
H. (H.) inermis S. I. Smith, 1974	FW
H. (H.) longicornis Bousfield, 1996	FW
H. (H.) muerta Baldinger, Shepard, & Threloff 2000	FW

Hyalella	*(H.) montezuma* Cole & Watkins, 1977	FW
H.	*(H.) sandra* Baldinger, Shepard, & Threloff 2000	FW
H.	*(H.) texana* Stevenson & Peden, 1973	FW
Parhyalella whelpleyi (Shoemaker, 1933)		G (FL)

Family Dogielinotidae Gurjanova, 1953

Proboscinotus loquax (Barnard, 1968)	P (ORE-WA)

Family Najnidae J. L. Barnard, 1972

Najna consiliorum Derzhavin, 1937		P (BER)
N.	*kitimati* Barnard, 1979	P (CAL)
N.	*lessoniophilum* Bousfield, 1981	P (CAL)
N.	*rugosum* Bousfield, 1981	P (AL-BC)
N.	*setosum* Bousfield, 1981	P (BC-ORE?)
N.	*plumulosum* Bousfield, 1981	P (BC-ORE?)

Family Eophliantidae Sheard, 1936

Lignophliantis pyrifera Barnard, 1969	P (S CAL)

Family Phliantidae Stebbing, 1899

Pariphinotus (Heterophlias) escabrosus (Barnard, 1969)		P (BC-CAL)
P.	*(H.) seclusus* (Shoemaker, 1933)	At (C), G (FL)

Family Talitridae Rafinesque, 1815

(a) Palustral subgroup (pragmatic subfamily group, Bousfield, 1984)

Uhlorchestia uhleri (Shoemaker, 1930)		At (C-FL)), G (FL-TEX)
U.	*spartinophila* Bousfield & Heard, 1986	At (V-C), G (FL)

(b) Beachflea subgroup (Bousfield, 1984)

Orchestia gammarella (Pallas, 1766)		At (AC)
Orcheslia grillus Bosc, 1802		At (AC-V); G (FL-TEX)
Paciforchestia klawei (Bousfield, 1959)		P (S CAL- B.C)
Platorchestia chathamensis Bousfield, 1982		P (BC)
P.	*platensis* (Kroyer, 1845)	At (AC-V), G (FL-TEX)
Tethorchestia sp 1 (= *tropica* Shoemaker MS)		G (FL)
Tethorchestia brevipleopoda (Bousfield MS)		G (FL)
Traskorchestia traskiana (Stimpson, 1856)		P (Al -CAL)
T.	*georgiana* (Bousfield, 1958)	P (CAL -BC)
T.	*ochotensis* (Brandt, 1851)	P (ALEUT)
Transorchestia enigmatica (Bousfield & Carlton, 1968)		P (CAL, intr.)

(c) Sandhopper subgroup (Bousfield, 1984)

Americorchestia longicornis (Say, 1818)		At (AC-V), G
A.	*barbarae* Bousfield, 1992	G (TEX)

Americorchestia heardi Bousfield, 1992	G (FL-LA)
A. *megalophthalma* (Bate, 1862)	At (AC-C)
A. *salomani* Bousfield, 1992	G (FL-LA)
Megalorchestia californiana (Brandt, 1851)	P
M. *columbiana* (Bousfield, 1958)	P
M. *minor* (Bousfield, 1957)	P (S CAL)
M. *dexterae* Bousfield, 1982	P (S-B CAL)
M. *pugettensis* (Stimpson, 1856)	P
M. *corniculata* (Stout, 1912)	P (CAL)
M. *benedicti* (Shoemaker, 1936)	P (CAL)

(d) Landhopper subgroup (Bousfield, 1984)

Arcitalitrus sylvaticus (Haswell, 1879)	P (CAL, intr.)
Talitroides topitotum (Burt, 1934?)	P (CAL, intr.), G (FL-MI, intr.)
T. *alluaudi* (Chevreux, 1896)	P (BC - CAL), At (intr.), G (FL)

Superfamily Pontoporeioidea Bousfield, 1979 [= Haustorioidea Barnard & Drummond, 1982 (part)]

Family Bathyporeiidae Bousfield, 1978

Amphiporeia gigantea Bousfield, 1973	At (AC)
A. *lawrenciana* Shoemaker, 1929	At (AC)
A. *virginiana* Shoemaker, 1933	At AC), G (E FL?)
Bathyporeia parkeri Bousfield, 1973	At (V-C) G (E FL)
B. *quoddyensis* Shoemaker, 1949	At (AC-V)

Family Pontoporeiidae Dana, 1855

Diporeia brevicornis (Segerstrale, 1937)	FW
D. *erythrophthalma* (Waldron, 1953)	FW
D. *filicornis* (Smith, 1974)	FW
D. *hoyi* (Smith, 1874)	FW
D. *intermedia* (Segerstrale, 1977)	FW
D. *kendalli* (Norton, 1909)	FW
Monoporeia affinis (Lindstrom, 1885)	A-At (ST L), P (AL)
Pontoporeia femorata Kroyer, 1842	P (AL-BC)-A-At (ST L-AC)
Priscillina armata (Boeck, 1861)	A-At (ST L - AC)

Family Haustoriidae Stebbing, 1906

Acanthohaustorius bousfieldi Frame, 1982	At (V)
A. cf. *bousfieldi* Frame, 1980	G (E FL)
A. *intermedius* Bousfield, 1965	At (V-C)
A. nr. *intermedius* Bousfield, 1965	G (FL?)
A. *millsi* Bousfield, 1965	At (V-C) G (E. FL)
A. *uncinus* Foster, 1988	G (FL-MI)
A. *pansus* Thomas & Barnard, 1984	G (FL)
A. *shoemakeri* Bousfield,1965	At (V-C)
A. cf. *shoemakeri* Bousfield 1965	G (NW FL)
A. *similis* Frame, 1980	At (V-C)

A. spinosus (Bousfield, 1962)	At (AC-Del)
A. uncinus Foster, 1989	G (FL-MI)
Eohaustorius brevicuspis Bosworth, 1973	P (BC-ORE)
E. eous (Gurjanova, 1951)	P (BER)
E. sencillus Barnard, 1962	P (CAL)
E. washingtonianus (Thorsteinsen, 1941)	P (AL-CAL?)
E. estuarius Bosworth, 1973	P (BC-ORE)
E. sawyeri Bosworth, 1973	P (BFC-ORE)
Haustorius canadensis Bousfield, 1962	At (SW G-V) (G (FL?)
H. jayneae Foster & LeCroy, 1991	G (NE)
Lepidactylus dytiscus Say, 1818	G (E FL)
L. triarticulatus Robertson & Shelton, 1980	G (FL-TEX)
Neohaustorius biarticulatus Bousfield, 1965	At (V-C), G (E FL?)
N. schmitzi Bousfield, 1965	At (V-C), G (E FL)
Parahaustorius attenuatus Bousfield, 1965	At (V)
P. holmesi Bousfield, 1965	At (AC) G (FL?)
P. longimerus Bousfield, 1965	At (V-C) G (FL?)
P. cf. *longimerus* Bousfield, 1965	G (W. FL)
P. obliquus Robertson & Shelton, 1978	G (FL-TEX)
Protohaustorius bousfieldi Robertson & Shelton, 1978	G (FL-TEX)
P. deichmannae Bousfield, 1965	At (V) G (FL?)
P. wigleyi Bousfield, 1965	At (V) G (FL?)
Pseudohaustorius americanus (Pearse, 1908)	G (FL-MI)
P. borealis Bousfield, 1965	At (V)
P. caroliniensis Bousfield, 1965	At V-CAR-E FL?)

Superfamily Gammaroidea Bousfield, 1977 [= gammaroid group Barnard & Barnard, 1983 (part]

Family Gammaridae Leach, 1813

Chaetogammarus stoerensis (Reid, 1938)	At (AC)
C. ischnus (Sars, 1896)	FW (intr.)(Witt, et al, 1998))
Eulimnogammarus obtusatus (Dahl, 1938)	At (AC-ST L)
Gammarus acherondytes Hubricht & Mackin, 1940	FW
G. annulatus S. I. Smith, 1874	At (ST L - AC)
G. bousfieldi Cole & Minckley 1961	FW
G. daiberi Bousfield, 1969	P (CAL, intr.)-At (V-C)-G?
G. desperatus Cole, 1981	FW
G. duebeni Liljeborg, 1851	At (AC)
G. fasciatus Say, 1818	FW
G. hyalelloides Cole, 1976	FW
G. jenneri Bynum & Fox, 1977	At (V-C)
G. lacustris lacustris Sars, 1864	FW
G. lawrencianus Bousfield, 1956	A-At
G. limnaeus S. I. Smith, 1874	FW
G. minus minus Say, 1818	FW
G. minus pinicollis Cole, 1976	FW
G. paynei Delong, 1992	FW
G. pecos Cole & Bousfield, 1970	FW
G. pseudolimnaeus Bousfield, 1958	FW
G. tigrinus Sexton, 1939	At (AC-C)G (FL-LA)

G. troglophilus Hubricht & Mackin, 1940	FW
G. (Lagunogammarus) oceanicus (Segerstrale, 1947)	At (A-AC)
G. (L.) setosus Dementieva, 1931	P (AL-BC)-A-At
G. (L.) wilkitzkii (Birula, 1897)	A
G. (Mucrogammarus) mucronatus (Say, 1818)	At (AC-V-C), G(FL), P (Salton Sea)
G. (M.). palustris Bousfield, 1969	G (FL?)
Marinogammarus finmarchicus Dahl, 1938	At (AC-V-C)

Family Anisogammaridae Bousfield, 1977

Anisogammarus pugettensis pugettensis (Dana, 1853)	P (AL-CAL)
A. amchitkana Bousfield, 2001	P (AL-)
A. epistomus Bousfield, 2001	P (BC)
A. slatteryi Bousfield, 2001	P (BER-WA)
Barrowgammarus mcginitiei (Shoemaker, 1955)	P-A (BAR)
Carineogammarus makarovi (Bulycheva, 1952)	P (SE AL)
Eogammarus oclairi Bousfield, 1979	P (BC-ORE)
E. confervicolus (Stimpson, 1856)	P (SE AL- CAL)
E. psammophilus Bousfield, 1979	P (ALEUT)
Locustogammarus levingsi Bousfield, 1979	P (SE AL-BC)
L. locustoides (Brandt, 1851)	P (AL-BC)
Ramellogammarus campestris Bousfield & Morino, 1992	FW P (ORE)
R. californicus Bousfield & Morino, 1992	FW P (CAL)
R. columbianus Bousfield & Morino, 1992	FW P (BC-ORE)
R. oregonensis (Shoemaker, 1944)	FW P (ORE)
R. ramellus (Weckel, 1907)	FW P (CAL)
R. similimanus (Bousfield, 1961)	FW P (ORE)
R. setosus Bousfield & Morino, 1992	FW P (ORE)
R. littoralis Bousfield & Morino, 1992	FW P (ORE)
R. vancouverensis Bousfield, 1979	FW P (BC)
Spinulogammarus subcarinatus (Bate, 1862)	P (AL-BC)
Spasskogammarus tzvetkovae Bousfield, 1979	P (BER)

Family Gammaroporeiidae Bousfield, 1977

Gammaroporeia alaskensis (Bousfield & Hubbard,1968)	P (SE AL)

Family Mesogammaridae Bousfield, 1977

Paramesogammarus americanus Bousfield, 1979	P (SE AL)

Superfamily Hadzioidea Bousfield, 1977 [= hadzioids Barnard & Barnard, 1983]

Family Allocrangoncytidae Holsinger, 1989

Allocranqonyx hubrichti Holsinger, 1971	FW
A. pellucidus (Mackin, 1935)	FW

Family Hadziidae S. Karaman, 1933

Weckeliid subgroup (Holsinger, 1992) (= weckeliids of Barnard & Barnard, 1983)

Allotexiweckelia hirsuta Holsinger, 1980	FW (TX)

Holsingerius samacos (Holsinger, 1980)	FW
H. smaragdinus Holsinger, 1992b	FW
Mexiweckelia hardeni Holsinger, 1992b	FW
Paramexiweckelia ruffoi Holsinger, 1993	FW
Texiweckelia texensis (Holsinger, 1973)	FW (TEX)
Texiweckeliopsis insolita (Holsinger, 1980)	FW (TEX)

Hadziid subgroup (= hadziids of Barnard & Barnard, 1983)

Dulzura sal J. L. Barnard, 1969	P (CAL)
Protohadzia sp. Zimmerman & Barnard, 1977	G (FL?)
P. schoenerae (Fox, 1973)	At (C); G (FL)
Metaniphargus beattyi Shoemaker, 1942	G (FL?)
Netamelita barnardi McKinney et al, 1978	G (TEX)
N. brocha Thomas & Barnard, 1991c	G (FL)
N. cortada Barnard, 1962	P (S CAL)
Spathiopsis looensis Thomas & Barnard, 1985	G (FL)

Gammarellas (=nuuanids Barnard & Barnard, 1983)

Tabatzius muelleri (Ortiz, 1976)	G (FL-YUC)
T. copillius (McKinney & Barnard, 1977)	G (FL?-YUC)

Family Melitidae Bousfield, 1973 [= melitids + ceradocids sensu Barnard & Barnard, 1983 (part)}

Abludomelita obtusa (Monatagu, 1813)	P? (WA?), At (ST L)
Anamaera hixoni Thomas & Barnard, 1985	G (FL)
Bathyceradocus torelli (Goes, 1966)	P (bathyal), A-At (ST L, deep)
Ceradocus colei (Kunkel, 1910)	At (V)
C. paucidentatus Barnard, 1952	P (CAL)
C. rubromaculatus (Stimpson, 1856)	P
*C. sheardi Shoe*maker, 1948	G (W FL)
C. shoemakeri Fox, 1973	At (C); G (FL)
C. spinicauda (Holmes, 1908)	P (BC-CAL)
Denticeradocus sp. (see Barnard, 1952)	P (CAL)
Desdimelita barnardi Jarrett & Bousfield, 1996	P (BC)
D. desdichada (J. L. Barnard, 1962)	P (SE AL-CAL)
D. californica (Alderman, 1936)	P (AL-CAL)
D. microdentata Jarrett & Bousfield,1996	P (SE AL-ORE)
D. microphthalma Jarrett & Bousfield, 1996	P (SE AL)
D. transmelita Jarrett & Bousfield, 1996	P (BC)
Dulichiella appendiculata (Say, 1818)	P (SCAL);At (C); G (FL-LA)
Elasmopus antennatus (Stout, 1913)	P (SE AL-CAL)
E. balcomanus Thomas & Barnard, 1988	G (FL)
E. bampo Barnard, 1979	P (CAL)
E. holgurus Barnard, 1962	P (CAL)
E. lemaitrei Ortiz, 1994	G (FL? CUBA)
E. levis (S. I. Smith, 1873)	At (V-C), G (FL)
E. mutatus Barnard, 1962	P (WA -CAL)
E. pectenicrus (Bate, 1862)	G (FL)
E. pocillimanus (Bate, 1862)	G (FL)
E. serricatus Barnard, 1969	P (S CAL)
E. thomasi Ortiz, 1994	G (FL - CUBAt)
Eriopisa elongata Bruzelius, 1859	P (CAL) -At (V-C, shelf), G (FL?)

E *incisa* McKinney, Kalke & Holland, 1978	G (TEX)
E. *schoenerae* Fox, 1973	G (FL?)
Eriopisa sp. (Barnard, 1952)	P (S CAL)
Jerbarnia americana Watling 1981	At (C-E FL)-,G (FL)
Lupimaera lupana (Barnard, 1969)	P (CAL)
Maera danae (Stimpson, 1853)	P-At (AC)
M. cf. *danae* Krapp-Schickel & Jarrett. 2000	P (AL-SE AL)
M. *loveni* (Bruzelius, 1859)	P (Al-WA)-A-At (N)
M. *fusca* (Bate, 1864)	P (AL-WA)
M. *nelsonae* Krapp-Schickel & Jarrett, 2000	P (BER-CAL)
M. *bousfieldi* Krapp-Schickel & Jarrett, 2000	P (BC-CAL)
M.. *jerrica* Krapp-Schickel & Jarrett, 2000	P (SE AL- ORE)
M. *similis* Stout, 1913	P (BC-MEX)
Maera diffidentia J. L. Barnard, 1969	At (NC-G (FL)
M.. *rathbunae* Pearse, 1908	G (FL-MI)
Maera sp. (nr. *rathbunae*) Krapp-Schickel & Jarrett, 2000	P (BC - At (NC)
M. *grossimana* (Montagu, 1808)?	P (BC-ORE)
M. *prionochira* Bruggen, 1907	P (AL)
M. *quadrimana* (Dana, 1853)	G (CUBA-FL)
M. *reishi* Barnard, 1979	P (CAL?)
M. *serrata* Schellenberg, 1938	G (CUBA-FL?)
M. *sulca* (Stout, 1913)	P (S CAL)
M. *williamsi* Bynum & Fox, 1977	At (C); G (FL)
Megamoera amoena (Hansen, 1887)	A
M. *bowmani* Jarrett & Bousfield, 1996	P (SE AL)
M. *borealis* Jarrett & Bousfield, 1996	P (SE AL)
M. *dentata* (Kroyer, 1842)	P-A-At
M. *glacialis* Jarrett & Bousfield, 1996	P (SE AL)
M. *kodiakensis* (Barnard, 1964)	P (SE AL)
M. *mikulitschae* (Gurjanova, 1953)	P (BER)
M. *rafiae* Jarrett & Bousfield, 1996	P (SE AL)
M. *subtener* (Stimpson, 1856)	P (BC-CAL)
M *unimaki* Jarrett & Bousfield, 1996	P (ALEUT)
Melita alaskensis Jarrett & Bousfield, 1996	P (AL)
M. *intermedia* Sheridan, 1980	G (W FL)
M. *elongata* Sheridan, 1979	G (W FL)
M. *longisetosa* Sheridan, 1979	At (V-C). G (W FL)
M. *nitida* (S. I. Smith, 1874)	P (intr.)-At, G (E Fl)
M. *oregonensis* Barnard, 1954	P (BC-CAL)
M. *shoemakeri* (= *M. nitida* Shoemaker, 1936)	G (YUC)
M. *sulca* (Stout, 1913)	P (S CAL)
Melitoides makarovi Gurjanova, 1934	P (BER
M. *valida* (Shoemaker, 1964)	P (BER)
Quadrimaera carla Krapp-Schickel & Jarrett, 2000	P (BC - CAL)
?Q. *vigota* Barnard, 1969	P (CAL)
Quasimelita quadrispinosa (Vosseler, 1889)	PA (SE AL)-A-At (ST L)
Q. *formosa* (Murdoch, 1885)	A (AL)-At (ST L)
Spathiopus looensis Thomas & J. L. Barnard, 1985	G (FL)

Superfamily Bogidielloidea Bousfield, 1977 [= bogidiellids Barnard & Barnard,, 1983 (part)]

Family Atesiidae Holsinger & Longley, 1980

Artesia welbourni Holsinger, 1992b	FW TEX
A. *subterranea* Holsinger, 1980	FW TEX

Family Bogidiellidae Hertzog 1936

Parabogidiella americana Holsinger, 1980	FW TEX

Superfamily Corophioidea Barnard & Barnard, 1983 (revised)

Family Ampithoidae Stebbing, 1899

Ampithoe dalli Shoemaker, 1938	P (AL-ORE)
A. *divisura* Shoemaker, 1933	G (FL Keys)
A. *kussakini* Gurjanova, 1955	P (AL-BC))
A. *longimana* (S. I. Smith, 1873)	P?-At (V), G (W FL)
A. *lacertosa* Bate, 1858	P (AL-S CAL)
A. *plumulosa* Shoemaker, 1938	P (BC-S CAL)
A. *ramondi* Audoin, 1828 (= A. *divisura?*)	P?, G (FL)
A. *rubricata* (Montague, 1808)	At (AC)
A. *rubricatoides* Shoemaker, 1938	P (BER)
A. *sectimanus* Conlan & Bousfield, 1982	P (SE AL-ORE)
A. *simulans* Alderman, 1936	P (AL-ORE)
A. *valida* S. I. Smith, 1873	P (BC-CAL), At (V)), G (FL)
A. *volki* Gurjanova, 1938	P (BER?)
Cymadusa compta (S. I. Smith, 1873)	AT (V), G (W FL)
C. *filosa* Savigny, 1816	G (FL)
C. *uncinata* (Stout, 1912)	P (BC-CAL)
Peramphithoe eoa (Barnard, 1954)	P (BER?)
P *femorata* (Kroyer, 1845)	P-At?
P. *humeralis* (Stimpson, 1864)	P (SE AL-S CAL)
P. *mea* (Gurjanova, 1938)	P (ALEUT)
P. *lindbergi* (Gurjanova, 1938)	P (BER-CAL)
P. *stypotrupetes* Conlan & Chess, 1992	P (SE AL-CAL)
P. *plea* (Barnard, 1965)	P (BC-CAL)
P. *tea* (Barnard, 1965)	P (SE AL-S CAL)
Pleonexes aptos Barnard, 1969	P (S CAL)
Pseudamphithoides bacescui Ortiz, 1976	G (FL?, CUBA)
Sunamphitoe pelagica (Milne-Edwards, 1830)	At (offshore), G

Family Biancolinidae J. L. Barnard, 1972

Biancolina brassiacephala Lowry, 1974	G

Family Aoridae Stebbing, 1899

Arctolembos arcticus (Hansen, 1887)	A
Acuminodeutopus heteruropus Barnard, 1959	P (CAL)
Aoroides columbiae Walker, 1898	P (BER-CAL)

A. *exilis* Conlan & Bousfield, 1982	P (SE AL-CAL)
A. *inermis* Conlan & Bousfield, 1982	P (BC-CAL)
A. *intermedius* Conlan & Bousfield, 1982	P (BC)
A. *spinosus* Conlan & Bousfield, 1982	P (SE AL-ORE)
Bemlos audbettius Barnard, 1962	P (CAL)
B. *concavus* (Stout, 1913)	P (CAL-BC?)
B. *mackinneyi* Myers, 1978	G (FL)
B. *macromanus* Shoemaker, 1925	P (S CAL)
B. *sanmartini* Ortiz, Lalana & Lopez, 1992?	G (FL - CUBA)
Columbaora cyclocoxa Conlan & Bousfield, 1982	P (SE AL-S CAL)
Grandidierella bonnieroides Stephensen, 1948	G (W Fl-TEX)
G. *notoni* Shoemaker, 1935	G? (YUC?)
G. *japonica Stephensen,* 1938	P (CAL-BC, intr.)
Lembos (Arctolembos) arctica Hansen, 1887	A-P (BER)
L. *(Globosolembos) francanni* Reid, 1951	G (FL)
L. *(Globosoolembos) smithi* (Holmes, 1905)	G (FL-YUC)
L. *borealis* Myers, 1976	At (G-S)
L. *bruneomaculatus brunneomaculatus* Myers, 1977	G (FL)
L. *brunneomaculatus mackinneyi* Myers, 1978	G (FL-TEX)
L. *dentischium* Myers, 1977	G (FL)
L. *hypacanthus* (K. H. Barnard, 1916)	G (E FL)
L. *kunkelae* Myers, 1977	G (FL)
L. *minimus* Myers, 1977	G (FL)
L. *ovalipes* Myers, 1979	G (W FL)
L. *rectangulatus* Myers, 1977	G (FL)
L. *setosus* Myers, 1978	G (W FL)
L. *smithi* (Holmes 1905)	At (V-C)
L. *spinicarpus spincarpus* (Pearse, 1912)	G (FL)
L. *spinicarpus inermis* Myers, 1979	G (W FL)
L. *tigris* Myers, 1981	G (W FL)
L. *tigrinus* Myers, 1979	G (W FL)
L. *tempus* Myers, 1981	G (W FL)
L. *unicornis* Bynum & Fox, 1977	At (C), G (FL)
L. *unifasciatus unifasciatus* Myers, 1977	G (FL)
L. *unifasciatus reductus* Myers, 1979	G (W FL)
L. *websteri* Bate, 1856	At (ST L; V), G (E FL?)
Leptocheirus pinguis (Stimpson, 1853)	A-At (AC)
L. *plumulosus Shoemake*r, 1932	At (V), G (E Fl)
L. *rhizophorae* Ortiz, 1981	G (FL - CUBA)
Liocuna caeca Myers, 1981	G (W FL)
Microdeutopus anomalus (Rathke, 1843)	At (V)
M. *gryllotalpa* Costa, 1853	At (V)
M. *myersi* Bynum & Fox, 1977	At (C-FL), G (FL)
Neohela monstrosa Boeck, 1861	A-At (ST L)
N. *intermedia* Coyle & Mueller, 1981	P (W AL)
N. *pacifica* Gurjanova, 1953	P (CAL?)
Paramicrodeutopus schmitti (Shoemaker, 1942)	P (S CAL)
Pseudunciola obliquua (Shoemaker, 1949)	At (AC-V, shelf)
Pterunciola spinipes Just, 1977	At (off NC, deep)
Rildardanus laminosa (Pearse, 1912)	At (HAT)-G (W FL-AL)
Rudilemboides naglei Bousfield, 1973	At (V-C), G (FL)

Unicola crassipes Hansen 1887	A-At (N, slope)
U. dissimilis Shoemaker 1945	At (V-C), G (E FL?)
U. inermis Shoemaker 1945	A-At (AC-CHES)
U. irrorata Say, 1818	At (AC-V)
U. laticornis Hansen, 1887	A-At (AC-CV, deep)
U. leucopis (Kroyer, 1845)	A-At (AC)
U. serrata Shoemaker, 1945	G (FL-AL)
U. spicata Shoemaker, 1945	At,- G

Family Cheluridae Allman, 1847

Chelura terebrans Philippi, 1839	P (CAL, intr.), At (AC), G
Tropichelura gomezi Ortiz, 1976	G. (FL- CUBA)
T. insulae Barnard, 1959	G (FL)

Family Isaeidae Stebbing, 1906

Ampelisciphotis podophthalma (J L. Barnard, 1958)	P (CAL)
Audulla chelifera Chevreux, 1901	G (FL)
Cheirimedia macrocarpa america Conlan, 1983	P (BC-ORE)
C. macrodactyla Conlan, 1983	P (BER)
C. similicarpa Conlan, 1983	P (AL-BC)
C. zotea (Barnard, 1962)	P (BC-CAL)
Cheirophotis megacheles (Giles, 1885)	P (CAL)
Chevalia aviculae Walker, 1904	P (BC); G (FL)
C. carpenteri Barnard & Thomas, 1987	G (FL)
C. inaequalis (Stout, 1913)	G (FL)
C. mexicana Pearse, 1913	G (FL-LA)
Gammaropsis atlantica Stebbing, 1888	G (FL)
G. effrena (Barnard, 1964)	P (CAL)
G. ellisi Conlan, 1983	P (C-CAL)
G. inaequistylis Shoemaker, 1930	A-At (ST L shelf)
G. maculatus (Johnston, 1827)	A-At (N)
G. mamola (Barnard, 1962)	P (CAL)
G. martesia (Barnard, 1964)	P (CAL)?
G. melanops G. O. Sars, 1882	At (G)
G. nitida (Stimpson, 1853)	A-At (AC)
G. ocellatus Conlan, 1994	P (CAL, deep)
G. ociosa (J. L. Barnard, 1962)	P (CAL)
G. shoemakeri Conlan, 1983	P (BC- S. CAL)
G. sophiae (Boeck, 1861)	A-At (AC slope)
G. spinosa (Shoemaker, 1942)	P (BC-S.CAL)
G. sutherlandi Nelson, 1981	AT (N C), G (SE FL)
G. thompsoni (Walker, 1898)	P (SE AL-S CAL)
Microprotopus raneyi Wigley, 1966	At (C), G (W FL)
M. shoemakeri Lowry, 1972	At (V-C), G (E. FL- LA)
Pareurystheus alaskensis (Stebbing, 1910)	P (AL)
P. dentatus (Holmes, 1908)	P (BER-BC)
P. tzvetkovae (Conlan, 1983)	P (AL)
Photis bifurcata Barnard, 1962	P (WA-CAL)
P. brevipes Shoemaker, 1942	P (AL-CAL)

P.	*californica* Stout, 1913	P (CAL)
P.	*chiconola* Barnard, 1962	P (deep)
P.	*conchicola* Alderman, 1936	P (WA-CAL)
P.	*dentata* Shoemaker, 1945	At (V) G (FL)
P.	*elephantis* Barnard, 1962	P (CAL)
P.	*fischmanni* Gurjanova, 1938	P (BER)
P.	*kurilica* Gurjanova, 1955	P (BER-ORE)
P.	*lacia* J. L. Barnard, 1962	P (BC-CAL)
P.	*linearmanus* Conlan, 1994	P (CAL)
P.	*longicaudata* (Bate & Westwood, 1862)	G (FL)
P.	*macromana* McKinney et al, 1978	G (FL-W TEX)
P.	*macinerneyi* Conlan, 1983	P (BC-WA)
P.	*macrocoxa* Shoemaker, 1945	At (AC-V)
P.	*macrotica* Barnard, 1962	P (CAL)
P.	*melanica* McKinney, 1980	G (FL-TEX)
P.	*oligochaeta* Conlan, 1983	P (SE AL -BC)
P.	*pachydactyla* Conlan, 1983	P (SE AL-BC)
P.	*parvidons* Conlan, 1983	P (BC -WA)
P.	*pugnator* Shoemaker, 1945	At (C-FL), G (FL)
P.	*reinhardi* Kroyer, 1842	P?-A-At (AC-BF)
P.	*spasskii* Gurjanova, 1951	P (AL-BC)
P.	*spinicarpa* Shoemaker, 1942	P (CAL)?
P.	*tenuicornis* G. O. Sars, 1882	A-At (G-I, C)
P.	*trapherus* Thomas & Barnard, 1991b	G (FL)
P.	*typhlops* Conlan, 1994	P (CAL, deep)
P.	*viuda* J. L. Barnard, 1962	P (S CAL)
Podoceropsis	*amchitkensis* Conlan, 1983	P (AL)
P.	*angustimana* Conlan, 1983 (= *G. ociosa*?)	P (BC)
P.	*barnardi* (Kurjaschov & Tzvetkova, 1975)	P (BER -BC)
P.	*chionoecetophila* Conlan, 1983	P (ALEUT-ORE)
P.	*setosa* Conlan, 1983	P (AL)
Protomedeia	*articulata* Barnard, 1962	P (ORE-S CAL)
P.	*fasciata* Kroyer, 1842?	P? (WA), A-At
P.	*grandimana* Bruggen, 1905	P (BER-BC)A-At
P.	*penates* Barnard, 1966	P (BC CA)
P.	*prudens* Barnard, 1966	P (BC-S CAL)
P.	*stephenseni* Shoemaker,1955	A-At (ST L)

Family Neomegamphopidae Myers, 1981

Neomegamphopus	*heardi* Barnard & Thomas, 1987	G (FL)?
N.	*hiatus* Barnard & Thomas, 1987	G (FL)
N.	*kalanii* Barnard & Thomas, 1987	G (E FL)
N.	*pachiatus* Barnard & Thomas, 1987	G (S FL)?
N.	*roosevelti* Shoemaker, 1942	G (FL)

Family Ischyroceridae Stebbing, 1899
(contains **subfamilies Cerapiinae Budnikova and Ischyrocerinae Stebbing**)

Bonnierella linearis californica Barnard, 1966	P (OR-deep)

Cerapus tubularis Say, 1818	At (V-C)
C. benthophilus Thomas & Heard, 1979	G (FL)
C. cudjoe Lowry & Thomas, 1991	G (FL)
Ericthonius brasiliensis (Dana, 1853)	P (intr.?), G (FL)
E. difformis Milne-Edwards, 1830	P (WA?), A-At
E. fasciatus (Stimpson, 1853)	AT (ST L-V)
E. rubricornis (Stimpson, 1853)	P (BER-CAL),- At
E. tolli Bruggen, 1909	A-At (ST L)
Ischyrocerus anguipes (Kroyer, 1838)	P-A-At (to DEL) (not FL!)
I. claustris (Barnard, 1969)	P (CAL)
I. commensalis Chevreux, 1900	A-At (ST L)
I. gurjanovae Kudrjaschov, 1975	P (BER)
I. latipes Kroyer, 1842	A-At (ST L, slope)
I. malacus Barnard, 1964	P (CAL, deep)
I. megalops G. O. Sars, 1894	At (G-EM)
I. nanoides (Hansen, 1887)	P (WA?), At (ST L)
I. parvus Stout, 1913	P (S CAL)
I. pegalops Barnard, 1962	P (CAL)
I. *serratus* Gurjanova, 1938	P (AL?)
I. tuberculatus (Hoek, 1882) Gurjanova	P (BER)
I. tzvetkovae Kudrjaschov, 1975	P (BER)
Jassa borowskyae Conlan, 1990	P (AL-CAL)
J. *carltoni* Conlan, 1990	P (CAL)
J. marmorata Holmes, 1903	P - At (ST L -V-C)- G (E FL),
J. morinoi Conlan, 1990	P (BC-CAL)
J. myersi Conlan, 1990	P (CAL)
J. oclairi Conlan, 1990	P (AL-BC
J. shawi Conlan, 1990	P (BC-CAL)
J. slatteryi Conlan, 1990	P (BC-CAL)
J. staudei Conlan, 1990	P (SE Al - BC, ORE)
Microjassa bahamensis Conlan, 1995	At (E FL?)
M. boreopacifica Conlan, 1995	P (SE AL-BC)
M. barnardi Conlan, 1995	P (ORE-CAL)
M. bousfieldi Conlan, 1995	P (CAL)
M. floridensis Conlan, 1995	G (FL)
M. litotes Barnard, 1954	P (BC-CAL)
M. macrocoxa Shoemaker (1942)	AT (AC-G?)
M. micropalpa Shoemaker (1942)	At (V-C?)
M. tetradonta Conlan, 1995	P (CAL?) G (FL)
Parajassa angularis Shoemaker, 1942	P (CAL?)
Ventojassa ventosa (Barnard, 1962)	P (CAL, deep)
Neoischyrocerus claustris (J. L.Barnard, 1969)	P (CAL)

Family Corophiidae Dana, 1849

Subfamily Corophiinae Bousfield & Hoover, 1997

Americorophium spinicorne (Stimpson, 1957)	P (AL-CAL)
A. aquafuscum (Heard & Sikora, 1972)	At (C), G (FL-MI)
A. brevis (Shoemaker, 1949)	P (SE AL-CAL)
A. ellisi Shoemaker, 1943	G (FL-LA)

A. salmonis (Stimpson, 1857)	P (SE AL-WA)
A. stimpsoni (Shoemaker, 1941)	P (CAL)
Apocorophium acutum (Chevreux, 1908)	P (CAL, intr), At (V-C). G (FL)
A. lacustre (Vanhoffen, 1911)	At (V). G (E FL)
Apocorophium simile (Shoemaker, 1934)	At (C-E FL)
A. louisianum (Shoemaker, 1934)	G (FL-LA)
Corophium volutator (Pallas, 1776)	At (AC)
Crassicorophium crassicorne (Bruzelius, 1859)	P-A-At (tAC-CHES)
C. clarencense (Shoemaker, 1949)	P-A (BER)
C. bonelli (Milne Edwards, 1830)	P-A-At (AC)(not FL!)
Laticorophium baconi (Shoemaker, 1934)]	P (AL-CAL) (not FL!)
Monocorophium insidiosum (Crawford, 1937)	P (BC-CAL, intr?), At (ST L; V) (FL?)
M. acherusicum (Costa,1857)	P (AL-CAL) A-At (CHES), G (FL)
M. californianum (Shoemaker, 1934)	P (BC-CAL)
M. carlottensis Bousfield & Hoover, 1997	P (BC-SE AL)
M. oaklandense (Shoemaker, 1949)	P (CAL)
M. steinegeri (Gurjanova, 1951)	P (BER)
M. uenoi (Stephensen, 1932)	P (CAL, intr.)
M. tuberculatum (Shoemaker, 1934)	At (V-C), G (FL)
Sinocorophium alienensis (Chapman, 1988)	P (CAL, intr.)

Subfamily Siphonoecetinae Just, 1983

Siphonoecetes smithianus Rathbun, 1905	At (V, shelf)
Caribboecetes crassicornis Just,1984	G (FL?)

Family Podoceridae Leach, 1814

Dulichia rhabdoplastis McLoskey, 1970	P (SE AL-CAL)
D. tuberculata Boeck, 1870	P (WA?)-A-At (ST L)
Dulichiopsis remis (Barnard, 1964)	P (AL?)
Dyopedos arcticus (Murdoch, 1885)	P (WA, CAL)-A-At (ST L)
D. bispinus (Gurjanova, 1930)	P (AL-BC)-At
D. falcata (Bate, 1857)	A-At (ST L, slope)
D. monacanthus (Metzger, 1875)	A-At (ST L - CHES)
D. porrectus Bate, 1857	A-At (ST L)
D. spinosissima Kroyer, 1845	A-At (AC, slope)
D. unispinus (Gurjanova, 1951)	P (BER)
Paradulichia typica Boeck, 1870	PA (Barrow), At (ST L, slope)
Podocerus brasiliensis (Dana, 1853)	P (S CAL), G (FL)
P. chelonophilus Chevreux & DeGuerne, 1888	G (FL)(see Thomas & Barnard, 1992a)
P. cristatus (Thomson, 1879)	P (CAL)
P. fulanus Barnard, 1962	P (S CAL)
P. kleidus Thomas & Barnard, 1992b	G (Fl)
P. spongicolus Alderman, 1936	P (BC?-CAL)

SUBORDER CAPRELLIDEA Leach, 1814

Superfamily Caprelloidea Laubitz, 1993

Family Caprogammaridae Kudrjaschov & Vassilenko, 1966, emend McCain, 1970

Subfamily Caprogammarinae K. & V., 1966

Caprogammarus gurjanovae Kudrjaschov & Vassilenko,1966 WNP

Family Caprellidae White, 1847, emend McCain, 1970

Subfamily Caprellinae Leach, 1814

Caprella	*angusta* Mayer, 1903	P (BC-ORE)
C.	*alaskana* Mayer, 1903	P (BER-ALEUT-CAL))
C.	*andreae* (Mayer, 1890)	At (AC)- G
C.	*borealis* Mayer, 1903	P(AL-WA)
C.	*brevirostris* Mayer, 1903	P (CAL)
C.	*californica* Stimpson, 1857	P (BC-CAL)
C.	*carina* Mayer, 1903	A
C.	*ciliata* G.O. Sars, 1880?	P (AL)-N At
C.	*constantina* Mayer, 1903?	P (BER)
C.	*cristibrachium* Mayer, 1903?	P (BER-ALEUT)
C.	*danielevskii* Czern. 1868	At (FL)- G
C.	*drepanocheir* Mayer, 1890	P (AL-WA)
C.	*dubia* Hansen, 1888	At -A
C.	*equilibra* Say, 1818	At (V) - G - P (BC-WA intr?)
C.	*gracilior* Mayer, 1903	P (AL-CAL)
C.	*greenleyi* McCain, 1969	P (ORE-CAL)
C.	*incisa* Mayer, 1903	P (SE AL-CAL)
C.	*irregularis* Mayer, 1890	P (AL-WA)
C.	*kincaidi* Holmes 1904?	P (BER)
C.	*laeviuscula* Mayer, 1890?	P (AL-ORE)
C.	*linearis* L. 1758	A-At-N P
C.	*mendax* Mayer, 1903	P (BC)
C.	*mutica* Schurin, 1935	P (CAL)
C.	*natalensis* Mayer, 1903	P (BC-CAL)
C.	*paulina* Mayer, 1903	P (BER-ALEUT)
C.	*penantis* Leach, 1814	At-G; P (CAL intr?)
C.	*pilidigita* Laubitz, 1970	P (BC-WA)
C.	*pilipalma* Dougherty & Steinberg, 1953	P (CAL)
C.	*pustulata* Laubitz, 1970	P (SE AL-ORE)
C.	*radiuscula* Laubitz, 1970	P (SE AL-WA)
C.	*rinki* Stephensen, 1933	At (deep)
C.	*scabra* Holmes, 1904	P (SE AL)
C.	*scaura* Templeton, 1836	P (CAL)-At
C.	*septentrionalis* Kroyer, 1842?	P (BER?), A-At
C.	*striata* Mayer, 1903	P (AL-WA?)-A
C.	*trispinus* Honeyman, 1889	At (deep)
C.	*ungulina* Mayer, 1903	P (BC, deep)
C.	*unica* Mayer, 1903	At

C. uniforma La Follette, 1915	P (CAL)
C. verrucosa Boeck, 1872	P (BC-CAL)
Metacaprella anomala (Mayer, 1903)	P (AL-CAL)
M. ferresa Mayer, 1903	P (A-CAL)
M. horrida G. O. Sars, 1880	At-A
M. kennerlyi (Stimpson, 1864)	P (AL-CAL)

Subfamily Aeginellinae Vassilenko, 1968

Aeginella spinosa Boeck, 1861	N At (deep)
Aeginina longicornis (Kroyer, 1842)	A-At

Family Pariambidae Laubitz, 1993

Deutella californica Mayer, 1890	P (SE AL-CAL)
D. abracadabra Steinberg & Dougherty, 1952	At-G
D. incerta Mayer, 1903	G
Hemiaeginina minuta Mayer, 1890	At, G
Luconacea incerta Mayer, 1903	At (V)
Paracaprella tenuis Mayer, 1903	At (V)
P. pusilla Mayer, 1890	At G
P. cf. *temir* (fide Nelson, 1995)	G

Family Protellidae McCain, 1970, emend Laubitz, 1993

Mayerella limicola Huntsman,1915	At
M. banksia Laubitz, 1970	P (AL-CAL)
M. acanthopoda Benedict 1997	P (S CAL)
Protellina ingolfi Stephensen (1942?)	N At (deep)
Proaeginina norvegica (Stephensen, 1931)	N At
Protoaeginella sp. Laubitz & Mills, 1972	N At
Tritella pilimana Mayer 1903	P (AL-ORE)
T. laevis Mayer, 1903	P (BC-S CAL)
T. tenuissima Doughty & Steinberg 1953	P (CAL, deep)

Family Paracercopidae Vassilenko, 1968

Cercops holbolli Kroyer, 1842	A
C. compactus Laubitz, 1970	P
Paracercops setifer Vassilenko, 1972	P (BER?)

Family Caprellinoididae Laubitz, 1993

Pseudaeginella biscaynensis (McCain, 1968)	At (FL) G
Pseudoliropus vanus Laubitz, 1970	P (BC, deep)

Family Phtisicidae Vassilenko, 1968

Subfamily Phtisicinae Vassilenko, 1968

Phtisica marina Slabber, 1769	At-G
Perotripus brevIs (La Follette, 1915)	P (AL-S CAL)
Hemiproto wigleyi McCain, 1968	At (G -E FL)

Infraorder Cyamida Bousfield, 1979

Family Cyamidae Rafininesque, 1817 (revised Margolis, McDonald, & Bousfield 2000)

Cyamus (Cyamus) ceti (L.) Lamarck, 1801	P (AL-CAL), At	on *Balaena mysticetus*
C. (Cyamus) erraticus R. de Vauzeme, 1834	P (BC)-At	on *Balaena glacialis*
C. (Cyamus) ovalis R. de Vauzeme, 1834	P (SE AL)	on *Balaena glacialis*
C. (Cyamus) gracilis R. de Vauzeme, 1834	P (SE AL)-At	on *B. gracilis*
C. (Cyamus) monodontis Lutken, 1873	P (BER)-A-At	on beluga, narwhal
C. (Cyamus) nodosus Lutken, 1860	A	on narwhal
Cyamus (Paracyamus) balaenopterae K. H. Barnard, 1931	P-At	on balaenopteae (blue, fin)
C. (Paracyamus) boopis Lutken, 1870)	P (AL-CAL),Atl	on *Megaptera*
Cyamus (Mesocyamus) catodontis Margolis, 1954	P (BC)-At	on *Physeter*
C. (Mesocvyamus) orubraedon Waller, 1989	P	on *Berardius bairdi*
C. (Mesocyamus) mesorubraedon Margolis et al., 2000	P	on *Physeter*
Cyamus(Apocyamus) scammoni Dall, 1872	P (AL-CAL)	on *Eschrichtius*
C. (Apocyamus) eschrichtii Margolis et al, 2000	P	on *Eschrichtius*
C. (Apocyamus) kessleri Brandt, 1872	P (AL-CAL)	on *Eschrichtius*
Orcinocyamus orcinus (Leung, 1870)	P (BC+)	on *Orcinus orca*
Isocyamus delphini (Guerin-Meneville, 1836)	P (AL-CAL)	on porpoises, dolphins
I. globicipitis Lutken, 1973	At	on *Globicephalus*
I. kogiae Sedlak-Weinstein, 1992	P (CAL?)	on *Kogia* (pygmy sperm)
Neocyamus physeteris (Pouchet, 1888)	P (SE AL-BC)	on *Physeter, Globicephalus*
Platycyamus flaviscutatus Waller, 1989	P	on *Berardius bairdi*
Platycyamus thompsoni (Gosse, 1855) *ampullatus*	At	on *Hyoperodon*
Syncyamus pseudorcae Bowman, 1955	At	on *Pseudorca*
Scutocyamus parvus Lincoln & Hurley, 1974	At	on white-beak dolphin *(Cephalorhynchus)*